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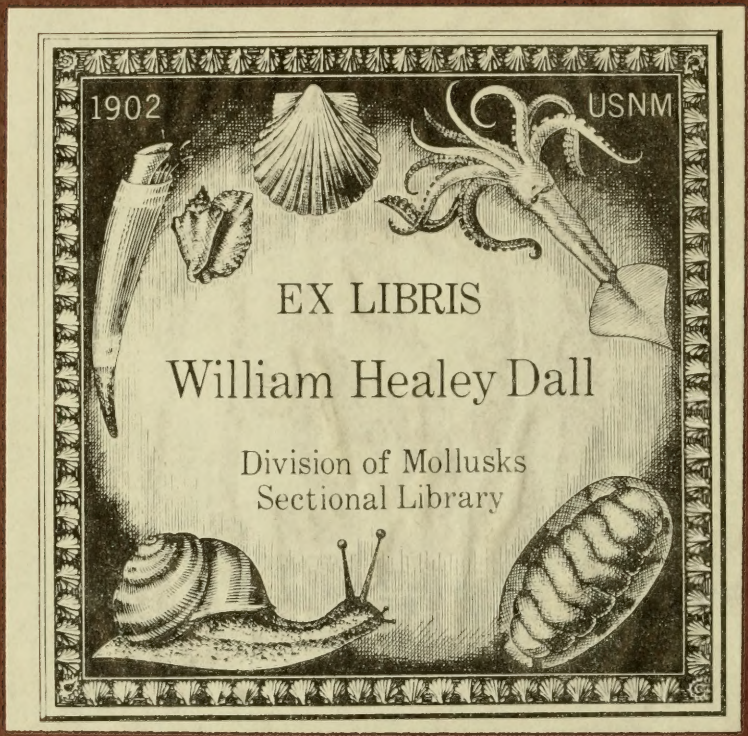
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CATALOGUE

OF THE

Marine Mollusks of Japan

WITH DESCRIPTIONS OF NEW SPECIES
AND NOTES ON OTHERS
COLLECTED BY

FREDERICK STEARNS

Division of Mollusks
Smithsonian Library

BY

HENRY A. PILSBRY

Conservator Conchological Section of the Academy of Natural Sciences of Philadelphia

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PREFACE.

THIS catalogue grew from the research incidental to the identification of the mollusca procured by Mr. Frederick Stearns during two visits to Japan. A portion of the collection made in 1889–'90 having been submitted to the writer for identification, it was found to contain a number of new and interesting species, some of which were described and figured in the *Proceedings of the Academy of Natural Sciences of Philadelphia* for 1891, and in the *The Nautilus*. A catalogue of this collection (pp. 20, 1 plate) was prepared by Mr. Stearns, and widely circulated among naturalists.

A much more extensive collection was secured by Mr. Stearns upon his second visit to Japan, and it was found necessary to review so considerable an amount of conchological literature in its identification, that it seemed desirable to collate the references to Japanese mollusks subsequent to the date of Dunker's excellent work, *Index Molluscorum maris Japonici*, as well as those not contained in that catalogue, and, together with descriptions and figures of the new forms discovered by Mr. Stearns, to publish a new catalogue of Japanese marine mollusca. The present volume contains about 500 species more than Dunker's *Index*, although a considerable number of forms enumerated by him are herein considered synonyms or are rejected from the Japanese list. 40 species and 8 varieties believed to be new are described, including some of which diagnoses have already appeared in the *Nautilus*, and the species of certain families, such as *Patellidæ*, *Fissurellidæ*, etc., are somewhat critically revised. In the families *Rissoidæ*, *Eulimidæ* and *Pyramidellidæ* a considerable number of forms collected by Mr. Stearns remain unidentified. Although some of them are doubtless new, the literature of these groups has been so overloaded with Arthur Adams' descriptions which do not describe, that intelligent work upon the Japanese forms is impossible. The literature of descriptive zoology furnishes but few instances of work more superficial and worthless than that of this industrious dilettante.

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The work consists of three portions: a list of marine mollusks which have been stated to inhabit Japan from Yezzo to Kiushiu, with references to description or figures of most species, and enumeration of the special localities at which each species has been found by previous naturalists or by Mr. Stearns. This is followed by a catalogue of the Inland mollusks taken by Mr. Stearns in Japan; and finally a list of mollusks of the Loo Choo group procured by Mr. Stearns is given.

I have identified the specimens collected in Japan; those from the Loo Choo Islands were identified partly by Mr. Stearns, partly by myself (see p. 160).

Recent investigations have added no very important facts to the general conclusions of Lischke regarding the status of the Japanese mollusk fauna in comparison with the Indo-Pacific faunas. The percentage of species peculiar to Japan has been considerably increased, however, and probably will be further augmented; although no doubt recent political events have added a considerable number of tropical species to what must hereafter be considered Japanese seas.

The classification used in the following pages while not entirely that of any one of the manuals, it is hoped will be found convenient for reference. The current generic nomenclature has been revised in certain cases; and for perhaps the first time in the century, certain Linnæan names, such as *Lima lima* and *Delphinula delphinula* have been restored to their rightful places.

It may be noticed that some new specific names employed herein resemble the names of certain localities or islands of the Japanese Empire; but we must here explicitly declare that between such specific and geographic names no necessary connection exists; and the former, except where the contrary is stated, should be taken as mere arbitrary or meaningless words. They will, therefore, not be subject to change on account of modifications in the current mode of transliteration from Japanese to the Roman character, nor from other causes.

Philadelphia, August, 1895. H. A. P.

INTRODUCTION.

DURING 1889–'90, the publisher of this Catalogue spent nearly a year in Japan, and some weeks in China. The journey was in quest of health and the pleasure of travel. Much time was devoted to making a typical collection of Japanese art work of many kinds. I had been, for some years before visiting Japan, much interested in its history, political evolution, and in the marvellous delicacy of many of its art products, and had studied and collected the latter with interest.

The result was a collection of over fifteen thousand objects in metal, lacquer, pottery, bronzes, fabrics, etc. This collection has been catalogued, mounted and presented to the Detroit Museum of Art.

Being also interested in natural history, I attempted to make a collection of the mollusks of the country, commencing first with such species as I found in the markets of Tokyo and Yokohama, and finally employing an intelligent Japanese fisherman—Morita Seto—who traversed the entire east coast from Tokyo, along Sagama and Saruga and the coasts of the Provinces Kii, Awa and Toza, along the north shore of the Inland Sea as far as Bingo, and, by aid of the fisherfolk, obtained nearly a thousand forms of marine life.

An account by Mr. J. E. Ives of the Echinoderms, Crustacea and Pycnogonida collected, will be found in Proc. Acad. Nat. Sci. Philadelphia for 1891, p. 210, plates VII–XII; and some of the Mollusks are described and illustrated by Mr. Pilsbry in the same volume, pp. 165, 471, plates IV, XVII, XVIII, XIX.

The Japanese fishermen, by the use of drag and dredge-nets, gather not only fish, but largely mollusks, working in water sometimes as deep as thirty fathoms.

The region visited lies between 33° and 36° north latitude, and 132° and 141° east longitude, on the east coast of the Japanese Islands. Here the Kuro-Shiwo or "Pacific Gulf Stream" flows north-easterly, and the presence of this warm current accounts, possibly, for the occasional finding of strictly tropical species.

In December, 1891, I set out upon a winding journey around the world, first spending the winter on the Hawaiian Islands, where I made some collections of shells, thence proceeded to Japan, where the following summer was passed. Here I traveled more extensively than during my former visit, the itinerary covering almost the entire length of the Empire, from the Province of Satsuma in the south, to Sapporo, the capital of the Island of Yezzo, in the north.

Profiting by the experience of my first visit, I availed myself of the assistance of coast-fishermen in collecting the rarer forms of mollusks, and, while the territory covered does not greatly exceed that of the earlier visit, much new material was obtained.

My Japanese collector, Morita Seto, spent a year—1891–2—in the Loo Choo Islands, collecting shells. But, as the fauna of that Archipelago is more closely allied to that of the Indo-Pacific region than the fauna of the Japanese waters, the results of the expedition were not so valuable as anticipated.

In conclusion it should be stated that I have spent an active business life as a manufacturing pharmacist, until circumstances permitted me within recent years to retire from active work in that profession, and devote my advanced years to travel, and to at least a superficial study of natural history; and hence I beg to be considered only as an amateur in conchology, and the public will understand that whatever of scientific merit this volume possesses, is due to my friend and editor Prof. H. A. Pilsbry.

Note:—Very many of the species enumerated in this Catalogue, to which my name is attached as collector, may be had in exchange by conchologists and collectors. Upon application, printed lists of such duplicates will be forwarded. Many species of which but few specimens were obtained upon my first visit, were found more abundantly on the second.

Frederick Stearns,
Detroit, Michigan,
U. S. A.

List of Abbreviations Used for the Principal Authorities Cited.

I. Works on the Fauna of Japan and North-east Asia.

Mal Ross. Beiträge zu einer Malacozoologia Rossica, von Dr. A. Th. von Middendorff. St. Petersburg, 1847.

Sib. Reise. Dr. A. Th. von Middendorff's Reise in den Aussersten Norden und Osten Siberiens. II, Zoologie, Mollusken, bearbeitet von A. Th. von Middendorff. St. Petersburg, 1851.

Amurl. Moll. Reisen und Forschungen im Amur-Lande, in den Jahren 1854–1856, etc., von Dr. Leopold v. Schrenck. II, Mollusken des Amur-Landes und des Nordjapanischen Meeres. St. Petersburg, 1867.

Moll. Jap. Mollusca Japonica, a Guilielmo Dunker, Stuttgart, 1861.

J. M. C. Japanische Meeres-Conchylien, von Dr. C. E. Lischke, I, II, III, Cassel, 1869–1874.

Faun. Jap. Fauna Molluscorum extramarinorum Japoniæ, etc., von Dr. W. Kobelt. Frankfurt a. M., 1880.

Index. Index Molluscorum maris Japonici, a Guilielmo Dunker, 1882.

II. Monographic and Iconographic Works.

Man. Conch. Manual of Conchology, by George W. Tryon, Jr., Philadelphia, 1878–1895. First series, Marine Univalves, Vols. I–X by Tryon; X–XVI, by H. A. Pilsbry. Second series, Terrestrial Mollusks, Vol. I–IV by Tryon; V–X by Pilsbry.

Conch. Cab. Systematisches Conchylien-Cabinet von Martini und Chemnitz, Zweite Ausgabe. Later and more useful volumes by Philippi, Pfeiffer, Dunker, Roemer, Clessin, von Martens, Kobelt, Brot, Weinkauff.

Abbild. Abbildungen und Beschreibungen neuer oder wenig gekannter Conchylien, von Dr. R. A. Philippi, I, II, III, 1845–1851.

Conch. Icon., or *C. Icon.* Conchologia Iconica, or Illustrations of the Shells of Molluscous Animals, by Lovell Reeve, Vols. I–XX, 1843–1878; later volumes by G. B. Sowerby.

Thes. Thesaurus Conchyliorum, by G. B. Sowerby, London, 1847–1887.

Nov. Conch., or *Novit. Conch.* Novitates Conchologicæ. Cassel.

III. Journals and Proceedings of Societies.

Am. Journ. Conch. American Journal of Conchology, edited by Geo. W. Tryon, Jr., Philadelphia, 1865–1872.

Ann. Mag. The Annals and Magazine of Natural History, London.

Bull. Soc. Zool. Fr. Bulletin de la Société Zoologique de France, Paris.

Jap. Ceph. Japanska Cephalopoder, af A. Appellöff; in Kongliga Svenska Vetenskaps-Akademiens Handlingar (new series) XXI, No. 13. Stockholm, 1886.

Journ. de Conch. Journal de Conchyliogie, publié sous la direction de H. Crosse et P. Fischer, Paris.

Nautilus. The Nautilus, a monthly journal devoted to the interests of conchologists. Edited by H. A. Pilsbry and C. W. Johnson, Philadelphia.

P. Z. S. Proceedings of the Zoological Society of London, 1830–1895.

IV. Voyages and Miscellaneous.

Astrol. Voyage de Découvertes de l'Astrolabe, exécuté par ordre du Roi pendant les années 1826–1829, etc. Zoologie, par MM. Quoy et Gaimard, Paris, 1832.

Chall. Rep. Challenger Reports, Cephalopoda, Vol. XVI, by W. E. Hoyle; Gastropoda and Scaphopoda, Vol. XV, by R. Boog Watson; Pelecypoda, Vol. XII, by E. A. Smith.

U. S. Expl. Exped., or *Expl. Exped.* United States Exploring Expedition, etc. Vol. XII, Mollusca and Shells, by Augustus A. Gould. Boston, 1852.

Otia. Otia Conchologica; Descriptions of Shells and Mollusks, from 1839 to 1862, by Augustus A. Gould, M. D. Boston, 1862.

Zool. Samarang or *Voy. Samarang.* The Zoology of the Voyage of H. M. S. Samarang, etc. Mollusca by Arthur Adams and Lovell Reeve. London, 1848.

CEPHALOPODA.

ARGONAUTIDÆ.

Argonauta argo Linné.

Several specimens collected by Stearns, Tokyo, etc.

Argonauta hians Solander (+**gondola** and **owenii** Ads. & Rve., Zool. Samarang)

Both the earless and eared forms collected by Mr. Stearns, Kishu coast and Inland Sea.

Argonauta boettgeri Malzan. J. de Conch., 1881, p. 163, pl. 6, f. 7.

A single specimen collected by Mr. Stearns agrees well with the description and figures of this species, but is slightly less compressed. Its habitat has not been known hitherto.

OCTOPODIDÆ.

Octopus vulgaris Lam.

Nagasaki (App.).

Octopus membranaceus Q. & G. Astrol., pl. 6, f. 5.

Japan.

Octopus globosus Appellof. Jap. Ceph., p. 7, pl. 1, f. 4, 5.

Nagasaki (App.).

Octopus macropus Risso. Chall. Rep., Vol. 16, p. 95.

Yokohama (Chall.).

Octopus cuvieri d'Orb. Appellof, Japanska Ceph., pl. 1, f. 6; Orb., Hist. Nat. Ceph., p. 18, pl. 1, 27.

Nagasaki (App.); compare *O. macropus*.

Octopus ocellatus Gray. Jap. Ceph., p. 8, pl. 1, f. 1–3.

Nagasaki (App.).

Octopus fang-siao d'Orbigny. Ceph. Acét., p. 70.

Japan.

SEPIOLIDÆ.

Inioteuthis morsei Verrill. Jap. Ceph., p. 15, pl. 2, f. 15, 16; pl. 3, f. 16, 19, 20, 23. Chall. Rep., p. 112. Pl. XIV, figs. 1–9.

Kobé and Tokyo Bay, 8–14 fms., mud (Chall.); Bay of Yedo (Verrill); Nagasaki (App.).

Inioteuthis japonica Fér. & Orb. Man. Conch., I, p. 157.

Promachoteuthis megaptera Hoyle. Chall. Rep., Vol. 16, p. 120, pl. 14, figs. 10–14. Wood cut 3.

S. Enoshima, 1875 fath., blue mud (Challenger).

SEPIIDÆ.

Sepia hercules Pilsbry. Pl. 1, figs. 1, 2. The Nautilus, VII, p. 144, April 2, 1894.

Shell having the general form of that of *S. esculenta* Hoyle but more convex ventrally; chitinous margin narrow; dorsal surface tuberculate-rugose as in *esculenta*, but more coarsely so, the posterior part having the tubercles very deeply separated, flat-topped, and leaning backward; dorsal surface evenly rounded, with no trace of a median longitudinal rib. Ventral surface as in *esculenta*, but the striation is much closer although the shell is triple the size. Last loculus has an index of 22. Inner cone well developed, its limbs arising about one-third the length of the shell from the posterior end, gradually rising along the sides, posteriorly reflexed and appressed on the outer cone, leaving below a narrow small cavity. The anterior edge of the inner cone does not form a shelf across the posterior end of the outer cone as is the case in *esculenta*, and the cavity is much smaller, shallower and narrower than in a specimen of *esculenta* 155 mill. in length. Spine very stout, conical, its root excavated ventrally. Color, white in the middle, faint pink at the sides; whitish beneath.

Length 425 mill.; greatest breadth 160 mill.; length of spine 19 mill.

This species is the giant of the genus, the shell being about 16⅞ inches long. It is allied to *S. esculenta* Hoyle, but differs as above indicated. The dorsal slope does not descend abruptly to the spine as in that species. Of *S. esculenta* a good many specimens are before me collected by Mr. Stearns. They agree well with the "Challenger" specimens. The size of *esculenta* is moderately constant, shells seen by Hoyle, Appellöff and myself being from 155 to 163 mill. long (about 6¼ inches).

A second specimen from the Luchu Is. exhibits the same characters throughout.

Sepia esculenta Hoyle. Hoyle, Challenger Rep., xvi, p. 129, pl. 17, f. 1–5; pl. 18, f. 1–61.

Yokohama (Challenger; Stearns).

The specimens of the shell agree well with Hoyle's figures.

Sepia andreanoides Hoyle. Hoyle, l. c., p. 139, pl. 21, f. 11–19.

Purchased in the market, Yokohama (Challenger); Ika Coast (Stearns).

Sepia andreana Steenstrup. Steenstrup, Vidensk. Selsk. Skr., X, No. 7, pl. 1, f. 11–19, 1875.

Japan (Stp.).

Sepia n. sp.

A species of Rochebrune's section *Doratosepion*, allied to *S. andreana* Stp., *S. andreanoides* Hoyle and *S. kobiensis* Hoyle, but crimson above. Yeda coast (Stearns).

Sepia peterseni Appellof. Jap. Ceph., p. 23, pl. 2, f. 1–6; pl. 3, f. 21.

Sepia kobiensis Hoyle. Chall. Rep., Vol. 16, p. 142; pl. 18, figs. 7–14. Wood cut 7.

Kobé Bay, 8 fath., mud.

Sepia (Metasepia) tullbergi Appellof. Jap. Ceph., p. 26, pl. 2, f. 7–14.

Nagasaki.

Sepiella maindroni de Rochebrune. Chall. Rep., Vol. 16, p. 149, pl. 22, figs. 1–10.

Inland Sea, Japan.

LOLIGINIDÆ.

Sepioteuthis lessoniana Fér. Jap. Ceph., p. 31.

Nagasaki.

Sepioteuthis sinensis Orbigny. Japan.

Loligo edulis Hoyle. Chall. Rep., Vol. 16, p. 152, pl. 23.

Yokohama Market (Challenger).

Loligo kobiensis Hoyle. Chall. Rep., Vol. 16, p. 154, pl. 25, figs. 1–10.

Kobé Bay, 8 fath., mud (Challenger).

Loligo japonica Steenstrup. Chall. Rep., Vol. 16, p. 157; pl. 24, figs. 7–15.

Yokohama Market, (Challenger).

Loligo bleekeri Keferstein. Jap. Ceph., p. 31, pl. 1, f. 7–10.

Nagasaki.

Loligo ? sumatrensis d'Orbigny. Jap. Ceph., p. 32, pl. 1, f. 11; pl. 3, f. 11–15.

Japan (App.).

Loligo ? sp.

Numerous very large "pens" measuring 31 cm. in length, and resembling those of *Loligo* were brought by Mr. Stearns from Yokohama.

OMMASTREPHIDÆ.

Ommastrephes pacificus Steenstrup. Jap. Ceph., p. 35, pl. 3, f. 8–10.

Japan (App.).

Ommastrephes bartramii Lesueur.

Japan (teste Mitsukuri & Ikeda). Seems a very doubtful identification.

Architeuthis n. sp.? Mitsukuri & Ikeda. The Zool. Mag., Tokyo, vii, p. 39, pl. 10.

Bay of Tateyama, Prov. Awa, E. side Bay of Tokyo.

Megateuthus martensii Hilgendorf. Sitzungsber. Ges. naturforsch. Fr. Berl., 1880, p. 65.

Yedo (Hilg.).

Todarodes pacificus Steenstrup. Chall. Rep., Vol. 16, p. 163, pl. 28, figs. 1–5.

Inland Sea.

TODARIDÆ.

Gonatus fabricii (Lichtenstein) Steenstrup. Chall. Rep., Vol. 16, p. 174, pl. .

Japan.

CRANCHIIDÆ.

Loligopsis (?) chrysophalmus Tilesius. Man. Conch., p. 164.

Japan.

NAUTILIDÆ.

Nautilus pompilius has been reported from Japan by Dunker, but its occurrence there is doubtful.

PTEROPODA.

As these mollusks are wholly pelagic in habits, the number occuring in Japanese waters will probably be larger than given below. For literature see Pelseneer, Report on Pteropoda coll. by Challenger.

PTEROPODA GYMNOSOMATA.

Several species of *Pteropoda gymnosomata* have been collected in the N. Pacific east of Japan, but we are still ignorant of the species which actually occur in Japanese waters. See Challenger Report, Vol. XIX, part lviii, p. 65.

PTEROPODA THECOSOMATA.

LIMACINIDÆ.

Limacina inflata d'Orbigny.

Corea Strait, (St. John).

Limacina lesueuri d'Orbigny.

Pacific E. of Japan,

Limacina bulimoides d'Orb. Same locality.

"Agadina" stimpsoni A. Ad. (=larval Gastropoda). Chall. Rep. Pter. Thec., p. 38, pl. 1, f. 11–14.

Kino-Osima (Ad.).

"Agadina" gouldii A. Ad.

Kino-Osima (Ad.).

CAVOLINIIDÆ.

Creseis virgula Rang. Bay of Yedo.

Creseis acicula Rang. China Sea, E. of Japan.

Hyalocylix striata Rang. China Sea, off E. Japan.

Styliola subula Q. & G. Off E. Japan.

Clio pyramidata Linné. Off E. Japan.

Clio cuspidata Bosc. Off E. Japan.

Cuvierina columnella Rang. Off E. Japan.

Cavolinia trispinosa Lesueur. Off Japan.

Cavolinia quadridentata Lesueur. China Sea, off S.-E. Japan.

Cavolinia globulosa Rang. China Sea.

Cavolinia gibbosa Rang. Same locality.

Cavolinia tridentata Forskal. Same locality.

Cavolinia uncinata Rang. Yedo.

Cavolinia inflexa Lesueur. Corea Strait, Yokohama.

PULMONATA.

SIPHONARIIDÆ.

Siphonaria atra Quoy & Gaimard. Q. & G., Voy de l'Astrol., pl. 25, figs. 41, 42. *S. cornuta* Gld., U. S. Expl. Exped., pl. 357, fig. 467. *S. coreensis* Ads. & Rve., Zool. Samarang, pl. 13, f. 1*a*, 1*b*.

Tokyo (Dkr.); Nagasaki (Lischke).

I have seen no Japanese specimens referable to this species. Perhaps the forms described by Gould and Adams and Reeve will prove distinct from the true *S. atra*.

Siphonaria sirius Pilsbry. Pl. VI, figs. 23, 24, 25, 26, 27, 28.

Shell oblong, polygonal, low conical with subcentral, erect apex: *primary ribs all single, generally 7, strongly elevated and white*: interspaces wide, dark brown, radially finely ribbed. Interior brown-

black, the larger ribs indicated by white rays; siphon occupying a single rib, never a double one. Cavity with a white callus (rarely chestnut colored), the region of the muscle impression bordered with chestnut stains. Length 22, breadth 17–19, alt. 5 mm.

Sagami, and Kashiwazaki, Boshiu, Japan (Frederick Stearns!).

This species differs from *S. atra* Q. & G., *coreënsis* A. & R., and their allies in having *the siphonal rib single and simple.* It is probably the species identified as *S. atra* by Dunker and other writers on Japanese shells. Several hundred specimens collected by Mr. Stearns agree in the characters above given. Not one shows any tendency to double the siphonal rib.

Siphonaria cochleariformis Reeve. Conch. Icon., pl. 6, figs. 28 a, b.

Koshinozaki, Boshiu (Stearns); Deshima (Dkr.); Nagasaki (Lischke). The specimens agree well with Reeve's figures, except that the entire interior is black-brown except for a narrow white border closely marked with dark at each rib interval.

Siphonaria acmæoides Pilsbry. Pl. VI, figs. 19, 20, 21, 22.

Shell oblong, nearly equilateral, but with excentric apex like *S. radiata* A. & R. (Zool. Samarang, pl. 13, fig. 2). The even surface hardly modified by the 9–16 low, wide ribs, between which it is very finely radially striated. Siphonal rib wide but low and inconspicuous. Apex spiral, bent down and appressed. Interior blackish or chestnut within the muscle impression, outside of which it is radially striped black and white, the siphonal channel extremely shallow and inconspicuous. Color outside whitish-buff, speckled and maculated with brown, or whitish on the principal ribs, the intervals black-brown. Length $12\frac{3}{4}$, breadth $9\frac{1}{2}$, alt. $3\frac{1}{2}$ mm.

Prov. Boshiu, Japan (Frederick Stearns).

This little species very closely resembles *Acmæa Heroldi* in the general form and the coloration of the interior.

OPISTHOBRANCHIATA.

ACTÆONIDÆ.

Solidula strigosa Gld. J. M. C., II, pl. 5, f. 12, 13.

Loo Choo and Kagoshima (Stimp.); Nagasaki (Birileff); Tokyo Harbor (Stearns); Gozo Harbor, 6 fms. (St. John).

Solidula fratercula Dkr. Index, p. 161, pl. 13, f. 21–23.

Japan (Dkr.).

Actæon siebaldi Rve. Man. Conch., XV, p. 148, pl. 19, f. 18, 19.
Japan (Siebold).

Leucotina dianæ Ad. Man. Conch., XV, p. 167, pl. 18, f. 68, 69.
Bay of Yedo (Lischke).

Leucotina gigantea Dkr. Index, p. 160, pl. 2, f. 8, 9.
Japan.

Leucotina sulcata A. Ad. Man. Conch., XV, p. 168.
Corea Strait, 46 fms. (Ad.).

Leucotina niphonensis A. Ad.
16 miles of Mino-Shima, off Nippon, Strait of Corea, 63 fms. (Ad.).

Leucotina exarata A. Ad. Man. Conch., xv, p. 168.
Tabu-Shima, 25 fms. (Ad.).

Leucotina inculpta A. Ad. Man. Conch., xv, p. 169.
St. of Corea, 46 fms. (Ad.).

Leucotina punctata A. Ad. Man. Conch., xv, p. 169.
Tabu-Shima, 25 fms. (Ad.).

Leucotina japonica A. Ad. Man. Conch., xv, p. 169.
Strait of Corea, off Nippon (Ad.).

Leucotina scitula A. Ad. Man. Conch., xv, p. 170.
Off Mino-Shima, 63 fms. (Ad.).

Bullina scabra Gmel. Man. Conch., xv, p, 176, pl. 45, f. 18–22.
Nemoto, Boshiu (Stearns).

TORNATINIDÆ.

Tornatina exilis Dkr. Moll. Jap., p. 25, pl. 2, f. 14.
Deshima (Dkr.); Nagasaki (Lischke).

Tornatina delicatula A. Ad. Man. Conch., xv, p. 190.
Mino-Shima, 63 fms. (Ad.).

Tornatina simplex A. Ad. Man. Conch., xv, p. 193, pl. 25, f. 51.
Japan (Ad.).

Tornatina gracilis A. Ad. Man. Conch., xv, p. 194, pl. 25, f. 49.
Japan (A. Ad.).

Tornatina fusiformis A. Ad. Man. Conch., xv, p. 194, pl, 22, f. 27.
Japan (A. Ad.).

Retusa succincta A. Ad. Man. Conch., xv, p. 222.
Tsu-Shima, 16 fms.; Awa-Shima, low water (Ad.).

Retusa (Pyrunculus) folliculus A. Ad. Man. Conch., xv, p. 270.

Tabu-Shima, 25 fms. (Ad.).

Retusa (Pyrunculus) phiala A. Ad. Man. Conch., xv, p. 230.

Mino-Shima, 63 fms. (Ad.).

Retusa (Pyrunculus) elliptica Ad. Man. Conch., xv, p. 231.

Tsu-Shima, 16 fms. (A. Ad.).

Volvula opalina, cylindrella, ovulina, A. Ad. Man. Conch., xv, p. 239, 240.

Mino-Shima, 63 fms. (Ad.).

Volvula spectabilis and **radiola** A. Ad. Man. Conch., xv, p. 240.

Tabu-Shima, 25 fms. (A. Ad.).

Volvula attenuata A. Ad. Man. Conch., xv, p. 240.

Tsu-Shima, 26 fms. (A. Ad.).

Volvula angustata A. Ad. Man. Conch., xv, p. 240.

Endermo Harbor, 4–7 fms. (St. John).

SCAPHANDRIDÆ.

Scaphander japonicus, cumingii, elongatus, A. Ad. Man. Conch., xv, p. 254.

Mino-Shima, 63 fms. (A. Ad.).

Scaphander sulcatinus A. Ad. Man. Conch., xv, p. 254.

Corea Strait, 46 fms. (Ad.).

Scaphander sieboldi, dilatatus A. Ad. Man. Conch., xv, p. 255.

Tsu-Shima, Japan, 26 fms. (Ad.).

The unfigured Scaphanders described from Japan by Adams may, some of them, prove to be Philines.

Smaragdinella sieboldi A. Ad. Man. Conch., xv, p. 260.

Takano-Shima, between tide marks (Ad.).

Atys naucum Linné. Man. Conch., xv, p. 263, pl. 28, f. 11–13, 16.

Deshima (Dkr.).

Atys scrobiculata A. Ad. Man. Conch., xv, p. 265.

Tabu-Shima, 25 fms. (Ad.).

Atys (Alicula) porcellana Gld. Man. Conch., xv, p. 268, pl. 28, f. 23; Ann. Mag., 1875, xvi, p. 114.

Kagoshima Bay (Stimp.), Matoza Harbor (St. John).

Atys (Alicula) secalina and **volvulina** A. Ad. Man. Conch., xv, p. 269, 270.

Tsu-Shima, Japan, 25 fms. (Ad.).

Atys (Roxania) punctulata A. Ad. Man. Conch., xv, p. 279.

Mino-Shima 63 fms. (Ad.).

Cylichna semisulcata Dunker. Index, p. 163, pl. 13, f. 7–9.

Japan.

Cylichna japonica and **rimata** A. Ad. Man. Conch., xv, p. 304, 305.

Corea Strait, 46 fms. (Ad.).

Cylichna proxima, lepidula, parallela, pumila, candidula A. Ad. Man. Conch., xv, pp. 304–307.

Tsu-Shima, 26 fms. (Ad.).

Cylichna venustula, consobrina, assimilis, inedita A. Ad. Man. Conch., xv, pp. 304–307.

Mino-Shima, 63 fms. (Ad.).

Cylichna latiuscula A. Ad. Man. Conch., xv, p. 305.

Tabu-Shima, 25 fms. (Ad.).

Cylichna pertenuis Smith. Man. Conch., xv, p. 307.

N. lat. 42° 52′, E. long. 144° 40′, 48 fms. (St. John).

Cylichna læta Gld. Man. Conch., xv, p. 308.

Kagoshima (Stimp.).

Cylichna consobrina Gld. Man. Conch., xv, p. 308.

W. coast of Yesso.

Cylichna concinna A. Ad. Thes., p. 593, pl. 125, f. 142.

Matoza Harbor, 6 fms. (St. John).

PHILINIDÆ.

Philina scalpta A. Adams. Lischke, J. M. C., III, p. 76, pl. 5, f. 15, 16.

Bay of Yedo (Lischke); Tsu-Shima (Ad.).

Philine japonica Lischke. J. M. C., III, p. 77, pl. 5, f. 13, 14 (P. striatella Tap.-Can., Viag. Magenta, pl. 2, f. 9).

Bay of Yedo (Lischke) Yokohama (Tap.-Can.). Specimens collected by Stearns show *japonica* and *striatella* to be identical.

Philine crenata and striolata A. Ad. Ann. Mag., 1862, ix, p. 160, 161.

Tsu-Shima (Ad.).

Philine argentata Gld. Otia Conch., p. 111.

Hakodate Bay (Stimpson), 2–6 fath., sandy mud.

Philine (Laona) zonata A. Ad. Ann. Mag. N. H., 1865, p. 324.

O-Shima; Yobuko (Ad.).

BULLIDÆ.

Bulla (vernicosa var.?) ovulum (Gld.) Sowb. Man. Conch., xv, p. 349.

Boshiu; Luchu Is. (Stearns).

AKERIDÆ.

Haminea angusta Gld. Man. Conch., xv, p. 361.

Simoda (Stimp.).

Haminea strigosa A. Ad. Man. Conch., xv, p. 362.

Tabu-Shima, 25 fms. (Ad.).

Haminea grisea Smith. Man. Conch., xv, p. 362.

Off Japan. Lat. 42° 52′ N.; Long. 144° 40′ E.; 48 fath.; sand and mud (St. John).

Haminea cymbalum Q. & G. Lischke, J. M. C., p. 105.

Nagasaki (Lischke).

Haminea constricta A. Ad. Man. Conch., xv, p. 370.

Japan (Schrenck).

HYDATINIDÆ.

Hydatina physis Linné. Man. Conch., xv, p. 387, pl. 45, f. 14–17.

Yedo (Lischke); Inland Sea (Stearns).

Hydatina albocincta Hoeven. Man. Conch., xv, p. 388, pl. 45, f. 29, 30.

Nagasaki (Birileff).

Hydatina inflata Dunker. Index, p. 162, pl. 2, f. 14–16.

Inland Sea at Wakayama.

RINGICULIDÆ.

Ringicula doliaris Gld. Man. Conch., xv, p. 403.

Hakodate Bay (Stimp.).; Kamakura (Stearns).

Ringicula arctata Gld. Man. Conch., xv, p. 403, pl. 47, f. 74, 75, 79.

Nagasaki (Birileff); Tokyo Harbor (Stearns).

Ringicula oelertiana Morlet. Journ. de Conchyl., 1880, p. 156, pl. 5, f. 4.

Japan (St. John).

APLYSIIDÆ.

Aplysia marginata and **marmorea** A. Ad. Ann. Mag., 1861, p. 140.

Port Hamilton (Ad.). Will probably occur in Japan.

Dolabella scapula Mart. Dkr., Index, p. 168.

Wakayama (Dkr.).

Phyllaplysia punctulata Tapperone-Canefri. Viag. Magenta, p. 112, pl. 2, f. 3.

Yokohama.

UMBRELLIDÆ.

Umbrella indica Linné. Dkr., Index, p. 169.

Japan (Dkr.).

Bertinia bertinia Jouss. Bull. Soc. Zool. Fr., 1883, p. 194, pl. 10, figs. 6, 8.

Japan.

[**NUDIBRANCHIATA** omitted].

PROSOBRANCHIATA.

(*Toxoglossa*).

TEREBRIDÆ.

Terebra albozonata Smith. Smith, P. Z. S., 1879, p. 185, pl. 19, f. 5.

Matoza Harbor (Smith); N. of Kiushiu (St. John).

Terebra adamsii Smith. Ann. Mag., 1875, p. 415.

Matoza Harbor, 6 fathoms.

Terebra (Myurella) bathyrhaphe Smith. Ann. Mag., 1875, p. 415; Challenger Gastrop., 1873–6, XV, p. 377, pl. XIV, fig. 9.

Gulf of Yedo 6 to 25 fathoms, soft mud and sand.

Terebra bifrons Hinds. Thes. Conch. I, p. 174, pl. 43, f. 57 (a small or young specimen.

S.-E. coast Prov. Kii (Stearns).

Terebra bipartita Gld. Otia Conch., p. 126.

Hakodate Bay (Stimpson).

Terebra duplicata Linné. Conch. Icon., f. 3.

Inland Sea (Stearns).

Terebra cingulifera Lam. Southeast coast Kii (Stearns).

Terebra dussumieri Kiener. Rve., C. Icon., f. 7.

Kamakura (Stearns, young); Nagasaki (Lischke).

Terebra evoluta Deshayes. Rve., Conch. Icon., XII, f. 55. Smith, P. Z. S., 1879, p. 183.

Ukushima, Goto Is., Matoza Harbor, (St. John); E. coast (Stearns).

Terebra flammea Lam. Rve., C. Icon., f. 13.

Japan (Dkr.).

Terebra fulgurata Phil. C. Icon., f. 151.

Tartary Strait (Schrenck).

Terebra gotoensis E. A. Smith. Smith, P. Z. S., 1879, p. 183, pl. 19, f. 1.

Goto Is. (St. John).

Terebra jeffreyii E. A. Smith. Smith, l. c., p. 184, pl. 19, f. 2.

East of Kii, and between S.-W. Nippon and Shikoku (St. John)

Terebra japonica Smith. Ann. Mag., 1875, p. 415.

Matoza Harbor 6 fathoms, sand.

Terebra lischkeana Dkr. Dkr., Index, p. 71, pl. 5, f. 13–16.

Kamakura; Idzu (Stearns).

Terebra loebbeckiana Dkr. Index, p. 72, pl. 5, f. 17, 18.

Inland Sea (Stearns).

Terebra maculata Linné. Tryon, Man., Vol. VII, p. 9, pl. I, figs. 9–10.

Japan? (Dunker). One specimen found by Stearns.

Terebra muscaria Lamarck. Man. Vol. VII, p. 9, pl. 1, fig. 12.

Japan (Dunker, Stearns); Nagasaki (Lischke, Tryon).

Terebra melanacme Smith. Ann. Mag., 1875, p. 415.

Cape Shima 18 fathoms, sand.

Terebra pretiosa Rve. C. Icon., f. 30a.

Japan (Dkr.).

Terebra pustulosa Smith. Smith, P. Z. S. 1879, p. 186. T. granulosa Smith, Ann. Mag., 1873, XI, p. 268.

Japan (A. Ad.).

Terebra (Myurella) polygyrata Deshayes. Ann. Mag., 1875, p. 415. Conch. Icon., XII, sp. 146.

Goza Harbor (St. John); Kamukura; Idzu; Kishiu; Tokyo Harbor (Stearns).

Terebra serotina Ads. & Rve. Ads. & Rve., Zool. Samarang, p. 30, pl. 10, f. 20.

Nagasaki (Ad.); Kishiu, Idzu (Stearns). In my opinion the *T. mariesi* Smith, P. Z. S., 1880, pl. 48, f. 5, is a synonym.

Terebra stearnsii Pilsbry. Proc. Acad. Nat. Sci., Phila., 1891, p. 472, pl. 19, f. 5.

Japan (Stearns).

Terebra strigillata Linn. Sowb., Thes. I, pl. 45, f. 122.

Nemoto, Boshiu, and Kamakura (Stearns); Nagasaki (Lischke).

Terebra subtextilis E. A. Smith. Sm., P. Z. S., 1879, p. 185, pl. 19, f. 3.

Idzu and Kishiu (Stearns); Shikoku (St. John).

Terebra subulata Linn. Nagasaki (Lischke); Japan (Stearns).

Terebra tantilla E. A. Smith. Smith, P. Z. S., 1879, p. 185, pl. 19, f. 4. (+T. pumilio Sm., Ann. Mag. 1873, xi, p. 269).

Between Nippon and Shikoku (St. John).

Terebra textilis Hinds. Hinds, Voy. Sulphur, p. 34; Rve., Conch. Icon., f. 130.

E. coast of Kii (St. John); Southern Japan.

Terebra torquata Adams & Reeve. Voy. Samarang, p. 30, pl. 10, f. 13.

Nagasaki (Lischke); E. of Goto Is. (St. John); Japan (Stearns).

Terebra triseriata Gray. Dkr., Index, p. 72, pl. 5, f. 19, 20.

Inland Sea (Stearns). Specimen a third larger than that figured by Dunker.

Several other Terebras have been reported from Japan, but not confirmed by recent collections. *T. blanda* Dh. (C. Icon., sp. 117); *T. dillwyni* Dh. (l. c., sp. 74); *T. tristis* Dh. (l. c., sp. 102); *T. solida* Dh. (l. c., sp. 123).

CONIDÆ.

Conus acutangulus Chemnitz. Conchyl. Cab., p. 165, Taf. 14, figs. 9, 10.

Japan (Kiener).

Conus aureus Hwass. Japan (Stearns).

Conus carinatus Swains. Japan (Stearns).

Conus catus Brug. Japan (Stearns).

Conus fulgetrum Sowerby. Conchyl. Cab., p. 199, Taf. 31, figs. 6–7.

Nagasaki (Lischke).

Conus fulmen Reeve. Conch. Icon., sp. 215.

Nagasaki (Lischke; Rein); Inland Sea (Stearns).

Conus hebræus Linn. Japan (A. Ad.; Stearns); Nagasaki (Lischke).

Conus intermedius Reeve. C. Icon., I, f. 129.

Japan (Dkr.).

Conus lentiginosus Reeve.

Two Japanese specimens collected by Stearns seem in every way typical. Reeve's figure is from a small example.

Conus lischkeanus Weinkauff. Conchyl. Cab., p. 311, Taf. 56, figs. 2, 3.

Kiushiu (Lischke).

Conus marmoreus Linn. Nagasaki (Lischke); Japan (Stearns).

Conus miles Linn. Tsushima (Stearns).

Conus miliaris Hwass. Japan (Stearns).

Conus orbignyi Audouin. Rve., C. Icon., I, sp. 17 (C. planicostatus Sowb.).
Japan (Dkr.).

Conus pauperculus Sowb. Dkr., Index, p. 94, pl. 2, figs. 4, 5.
Japan (Dkr., Stearns).

Conus pulicarius Hwass.
Yokohama (Dkr.); Japan (Stearns); Bay of Yedo (Lischke).

Conus quercinus Hwass. Japan (Stearns).

Conus sieboldi Reeve. C. Icon., I, f. 269.
Bay of Yedo (Lischke).

Conus tessellatus Born. C. Icon., f. 163.
Japan (Dkr.).

Conus textile Linné. Nagasaki (Lischke).

Conus tulipa Linn. Japan (Stearns).

Conus vexillum Gmel. Japan (Stearns).

[*Conus nebulosus* Sol. One specimen of the form with spire flat except for a conical elevated mucro, was obtained by Mr. Stearns in Japan; but is probably to be regarded as an adventitious shell not belonging to that fauna].

PLEUROTOMIDÆ.

Pleurotoma crispa Lamarck. Ooshima Harbor 8 fathoms (St. John).

Pleurotoma grandis Gray. Conch. Icon., fig. 13.
Japan (Dkr.).

Pleurotoma yedoensis Jouss. Bull. Soc. Zool. Fr., 1883, p. 196, pl. 10, fig. 7.
Japan. Is it a synonym of *P. grandis?*

Pleurotoma marmorata Lam. C. Icon., f. 139 (P. hastula Rve.). Kiener, Coq. Viv., pl. 6, f. 11. Smith, P. Z. S., 1879, p. 186.
Japan (Dkr.); betw. Nippon and Shikoku, 30 fms. (St. John).

Pleurotoma variegata Kiener. Coq. Viv., pl. 9, f. 1. Man. Conch., p. 164, pl. 2, f. 13.
Nagasaki (Lischke).

Pleurotoma picturata Weinkauff. Conchyl. Cab., p. 66, pl. 14, f. 13. (P. variegata Rve. not Kiener).
Japan (Lischke).

Pleurotoma unedo Valenciennes. Conchyl. Cab., p. 19, pl. 4, fig. 1.

Nagasaki, Yedo Bay (Lischke); Miura, Sagami (Stearns).

Pleurotoma cingulifera Lam. Inland Sea (Stearns).

Pleurotoma indica Desh. E. Coast, S. of Tokyo Harbor (Stearns).

Pleurotoma tuberculata Gray. Conchyl. Cab., p. 40, pl. fig. 1, 3. Man. Conch., vi, p. 237, pl. 5, f. 66, 67, C. Icon., f. 72.

Bay of Yedo (Dkr.).

Pleurotoma leucotropis Adams and Reeve. A. & R., Zool. Samarang, pl. 10, f. 7.

Sagami, Tokyo (Stearns); Matoza and Ooshima Harbors, 6 to 8 fathoms, sandy mud (St. John).

I suppose this is what Dunker (Index, p. 21) calls *P. albicarinata* Sowb. (see P. Z. S., 1870).

Pleurotoma declivis Martens. Conchol. Mittheil., p. 39, pl. 9, f. 2.

Japan, Hakodate (Hilgendorf).

Pleurotoma patruelis Smith. P. Z. S., 1879, p. 188, pl. 19, f. 10, 10a. Ann. Mag. 1875, p. 419.

Gulf of Yedo, 10½ fms. (St. John); Japan Sea, lat 34° 6′ N., long. 136° 15′ E., 11 fms. (St. John).

Pleurotoma sancti-ioannis Smith. Ann. Mag. N. H. (4), xv, p. 416.

One hundred miles southeast of Yesso, 48 fms. (St. John).

Pleurotoma triporcata Smith. P. Z. S., 1879, p. 188, pl. 19, f. 9.

Goto Is. (St. John).

Pleurotoma difficilis Smith. P. Z. S., 1879, p. 187, pl. 19, f. 8.

Between S.-W. extremity Nippon and I. Shikoku, north of Kiushiu (St. John).

Pleurotoma vertebrata Smith. Ann. Mag., 1875, p. 416, P. Z. S., 1879, p. 186, pl. 19, f. 6a.

Matoza Harbor, 6 fathoms, sand (St. John), and same localities as last species.

Pleurotoma tuberosa Smith. Ann. Mag., N. H., (4), xv, p. 418.

Ooshima Harbor, 8 fms.; Matoza Harbor, 6 fms.; Goza Harbor, 6 fms. (St. John).

Pleurotoma niponica Smith. P. Z. S., 1879, p. 187, pl. 19, f. 7.

Between S.-W. extremity Nippon and I. Shikoku (St. John).

Pleurotoma (Gemmula) fusca Homb. & Jacq. Voy. au Pole Sud, Zool., v, p. 111, pl. 25, f. 19, 20; Man. Conch., p. 173.

Goto Is., between S.-W. extremity Nippon and I. Shikoku, 30 fms. (St. John). Tryon believes the Japanese specimens referable to *gemmata* Hinds.

Pleurotoma? kamakurana n. sp. Pl. 2, fig. 15, 16.

Shell fusiform, much elongated, the canal nearly as long as the spire; dull brown, with an ill-defined light band around the middle; spire attenuated, the whorls very convex, almost angular, concave above and nearly smooth, appressed at the suture. Sculptured with numerous short vertical folds which do not extend on the body whorl below the level of the upper angle of mouth, and become obsolete on its latter half; and numerous subequal, crowded spiral cords throughout. Aperture nearly half the length of shell, long-elliptical above, passing into a long, open, straight canal below. Anal sinus wide and rather shallow; outer lip gently arched forward. Alt. 53, diam. 15 mill.

Kamakura (Stearns, 2 specimens).

Genotia Luhdorfi Lischke. J. M. C., III, pl. 1, f. 2–4.

Bay of Yedo (Lischke); Nemoto, Boshiu (Stearns).

Genotia engonia Watson. Challenger, Gastrop., 1873–6, XV, p. 300, pl. xx, fig. 7.

Enoshima, 345 fathoms, green mud.

Columbarium pagoda Lesson. Man. Conch., vi, p. 175. Dkr., Index, pl. 1, f. 8, 9, 10.

Japan.

Drillia candens Smith. P. Z. S., 1879, p. 192, pl. 19, f. 17.

Goto Is. (St. John).

Drillia chocolata Smith. Ann. Mag. N. H. (4), xv, p. 417.

Goza Harbor, 6 fms. (St. John).

Drillia consimilis Smith. P. Z. S., 1879, p. 188, pl. 19, f. 11.

South of Korea, 24 fms. (St. John).

Drillia erosa Schrenck. Amurl. Moll., p. 405, pl. 17, f. 5-7.

Bay of Castries (Schrenck); Nemoro, E. Yesso; off Cape Blunt; Yamada Harbor; E. of Yesso; 3–35 fms. (St. John).

Drillia flavidula Lamarck. Conchyl.-Cab., p. 45, pl. 10, fig. 1 to 5. Ann. Mag., 1875, p. 417.

North of Nippon in 43 fathoms, sand and mud; W. of Nippon, 3 fathoms soft mud; Goza Harbor, 6 fath. (St. John); Nagasaki (Lischke).

Drillia flavonodulosa Smith. P. Z. S., 1879, p. 194, pl. 19, f. 21.

Inland Sea, between Shikoku and Nippon (St. John).

Drillia fortilirata Smith. P. Z. S., 1879, p. 194, pl. 19, f. 22.

E. of Goto Is., and Nippon and Shikoku (St. John).

Drillia gracilenta Reeve. Smith, P. Z. S., 1879, p. 195, pl. 19, f. 24; Reeve, C. Icon., f. 114 (plus P. contracta Rve., f. 116, and P. fusoides Rve. f. 349).

E. coast of Kii, S. of Nippon (St. John); Kamakura and Tokyo Harbor (Stearns).

Drillia humilis Smith. P. Z. S., 1879, p. 193, pl. 19, f. 20.

Ojika Bay, Goto Is., 10 fms. (St. John).

Drillia principalis n. sp. Pl. 2, f. 17.

Shell resembling *D. jeffreysii* Smith, but decidedly more attenuated. Whorls about 13, angular convex, concave above, buff, finely mottled all over with reddish-brown, purplish on the spire, especially between the folds. Sculptured with oblique longitudinal folds (11 on penult. whorl) which stop abruptly at the shoulder and gradually decrease below; spirals rather spaced, coarse and unequal, alternating in size, absent on the concave upper surface of the whorls; the surface between liræ and over the concave anal fasciole finely spirally striate. Aperture sub-rhombic, narrowed below, slightly over one-third the shell's length; canal a little recurved. Anal sinus very deep, straight; outer lip arched forward, with a distinct sub-basal sinus. Columella moderately calloused and nearly straight below, bearing a callous tubercle above.

Alt. 53, diam. 18 mm.

Alt. 36, diam. 11 mm.

D. jeffreysii, while allied to this, is far broader if specimens of the same size be compared. *D. latisinuata* Smith has a wider, squarer anal sinus, with flaring posterior lobe of the outer lip. The shape of the sinus itself is different in *D. lanceolata* (Rve.) Martens. In some specimens the spiral liræ are much wider, flattened, and the folds more numerous. Inland Sea (Stearns).

Drillia inconstans Smith. Ann. Mag. N. H., 1875, (4), xv, p. 417.

Ooshima Harbor, 8 fms.; Tsushima Strait, 9 fms.; Matoza Harbor, 6 fms. (St. John).

Drillia intermaculata Smith. P. Z. S., 1879, pl. 19, f. 19.

South of Corea.

Drillia interrupta Lam. C. Icon., f. 51.

Deshima (Dkr.).

Drillia japonica Lischke. Smith, P. Z. S., 1879, p. 191, pl. 19, f. 15.

Boshiu, Kamakura, Tokyo Harbor, coast of Prov. Kii (Stearns); Nagasaki (Lischke); north of Kiushiu, 33° 56′ N. lat., 130° 27′ E. long. (Smith).

Drillia jeffreysii Smith. Ann. Mag. N. H. (4), xv, p. 417, 1875.

Goza Harbor, 3–43 fms. (St. John).

Drillia lanceolata Rve. Conch. Mittheil., I, p. 38, pl. 8, f. 4.

Hakodate (Hilgendorf.).

Drillia longispira Smith. P. Z. S., 1879, p. 190, pl. 19, f. 14.

East of Goto Is. (St. John).

Drillia ? tokyoensis n. sp. pl. 2, f. 5.

Shell fusiform, elongated, slender, dark chestnut-brown throughout. Whorls 6, slightly convex, separated by narrowly impressed sutures, the earlier 2 whorls smooth, the remainder strongly latticed. Spirals 15 on body-whorl, strong, equal and continuous; longitudinal ribs 22 on last whorl, about as high as the spiral cords, but wider and more rounded, disappearing on the very short canal. Penultimate whorl with 6 spiral cords. Aperture three-sevenths the total alt. of shell. Outer lip thickened by a rounded varix, within crenulated by short liræ; the anal notch deep, narrow and rounded, separated from suture by a heavy callus. Canal short and straight.

Alt. 7, diam. $2\frac{2}{3}$ mm.

Kamakura; Tokyo Harbor (Stearns).

Drillia nagasakiensis Smith. P. Z. S., 1879, p. 190, pl. 19, f. 13.

West of Nagasaki, 40–58 fms. (St. John).

Drillia obliquata Rve. C. Icon., f. 262.

Between Nippon and Shikoku (St. John).

Drillia peradmirabilis Smith. P. Z. S., 1879, p. 189, pl. 19, f. 12.

Goto Is. and South of Corea (St. John).

Drillia raricostata Smith. P. Z. S., 1879, p. 192, pl. 19, f. 18.

W. of Nagasaki (St. John).

Drillia reciproca Gld. Otia Conch., p. 133.

Ooshima (Stimpson).

Drillia sinensis Hinds. C. Icon., f. 153.

Japan (Dkr.).

Drillia subauriformis Smith. P. Z. S., 1879, p. 195, pl. 19, f. 23; Dkr., Index, p. 24, pl. 4, f. 5–7.

Tokyo Harbor and Kamakura (Stearns); between Nippon and Shikoku (St. John).

Drillia subobliquata Smith. P. Z. S., 1879, p. 191, pl. 19, f. 16.

East of Goto Is. (St. John).

Drillia texta Dkr. Moll. Jap., p. 2, pl. 1, f. 19.

Deshima (Dkr.); Tokyo Harbor (Stearns).

Drillia vidua Reeve. C. Icon., f. 192.

Japan (Dkr.).

Drillia (Crassispira) striata Kiener. C. Icon., f. 144.

Bay of Castries (Nordmann).

Oligotoma makimonos Jouss. Bull. Soc. Zool. Fr., 1883, p. 198, pl. 10, fig. 4.

Japan (Jouss.); neighborhood of Gulf of Yedo (Stearns).

Bela iessoensis Smith. Ann. Mag., 1875, p. 419.

S.-E. of Yedo, lat. 42° 58′ N., long. 104° 24′ E., 43 fath., sand and mud. (St. John).

Bela (Typhlomangilia) pyrrha Watson. Challenger Gastrop. 1873–6, XV, p. 316, (pl. XXV, f. 6).

Kobé and Yokohama, 50 fathoms, sand (Challenger).

Lachesis japonica A. Ad. P. Z. S., 1879, p. 198, pl. 20, f. 29.

Off Mino-Shima, 63 fms. (Ad.); E. of Goto Is., 58 fms. (St. John).

Clavatula virginea Val. C. Icon., i, f. 32 (Pleurotoma).

Hakodate (Lindholm).

Surcula javana Linné. Man. Conch., vi, p. 237 (syn. P. nodifera Lam., lurida Ads. & Rve., Zool. Samarang, pl. 10, f. 5).

Surcula coreanica Ads. & Rve. Zool. Samarang, pl. 10, f. 8.

Corea (Adams).

Surcula kaderleyi Lischke. J. M. C., III, pl. 1, f. 1.

Bay of Yedo (Lischke); Enoshima (Stearns).

Mangilia costulata Dkr. Moll. Jap., pl. 1, f. 20.

Deshima (Dkr.); Tokyo Harbor (Stearns).

Mangilia deshayesii Dkr. Moll. Jap., p. 3, pl. 1, f. 3.

Deshima.

Mangilia filicincta E. A. Smith. Ann. Mag., 1882, X, p. 216.

Japan (A. Adams).

Mangilia lischkei E. A. Smith. Ann. Mag., 1888 (6), II, p. 312.

Japan (Brit. Mus.).

Mangilia modica E. A. Smith. Ann. Mag., 1882, X, p. 213.

Japan (?).

Mangilia pygmæa Dkr. Moll. Jap., p. 2, pl. 1, f. 8.

Deshima.

Mangilia robusticostata Smith. P. Z. S., 1879, p. 198, pl. 19, f. 28.

Japan.

Mangilia splendida A. Ad. P. Z. S., 1867, p. 309, pl. 19, f. 24.

Goto Is. (Ad.).

Citharopsis cancellata A. Ad. Ann. Mag. 1865, p. 323.

Mino-Shima (Ad.)

Glyphostoma obtusicostata E. A. Smith. Ann. Mag., 1882, X, p. 304.

(?) Japan, probably.

Clathurella crassilabrum Rve. C. Icon., f. 118.

Hakodate (Albrecht).

Clathurella filosa Gld. Otia Conch., p. 134.

Ooshima (Stimpson).

Clathurella gracilispira Smith. P. Z. S., 1879, p. 196, pl. 19, f. 25 (Defrancia).

North of Kiushiu (St. John).

Clathurella leuckarti Dkr. Moll. Jap.; p. 2, pl. 1, f. 1.

Deshima (Dkr.); Tokyo Harbor and Kamakura (Stearns).

Clathurella perinsignis E. A. Smith. Ann. Mag., 1884, XIV, p. 322.

Japan (?).

Clathurella octangulata Dkr. Moll. Jap., p. 1, pl. 1, f. 8.

Deshima (Dkr.); north shore of Tango (Gaines, in Stearns coll.). Dunker's figures are not nearly so angular at the shoulder as these specimens.

Clathurella asperulata E. A. Smith. Ann. Mag., 1882, X, p. 296–7.

Japan (A. Adams).

Clathurella piperata E. A. Smith. Ann. Mag., 1882, X, p. 298.

Straits of Corea (A. Adams).

Clathurella rubro-apicata E. A. Smith. Ann. Mag., 1882, X, p. 296.

Japan (?).

Clathurella japonica Melvill. Proc. Malac. Soc. Lond., I, p. 227, pl. 14, f. 11.

Japan (Melv.).

Clathurella ? gainesii n. sp. Pl. 2, f. 4.

Shell elongated, turrited, corneous-brown, the interstices of the latticed sculpture dark brown. Whorls 7, very convex, separated by deep sutures; the earlier portion of spire attenuated. Sculpture consisting of strong, broadly rounded longitudinal folds (12 on last

whorl, becoming obsolete on the base) crossed by narrow but strong spiral cords separated by intervals greater than their width, continuous over the longitudinal folds but stronger between them, in number 14 on last whorl, 4 on penultimate whorl. Aperture contained 2½ times in length of shell; outer lip thick, narrowly varixed outside, having several rather strong teeth within; anal notch deeper than wide, oblique, separated from suture by a thin callus only. Anterior canal very short. Alt. 6¼, diam. 2⅔ mm.

Kamakura (Stearns); north shore of Tango (Gaines).

This species is named in honor of Mr. W. R. Gaines, formerly of Kyoto, who received numerous marine shells from the north shore of Tango, collected by his students. It has a slight resemblance to *D. subauriformis* Smith and *D. texta* Dkr.

Clathurella reticulosa E. A. Smith. Ann. Mag. 1882, X, p. 297.

Japan (A. Adams).

Daphnella? arota E. A. Smith. Ann. Mag., 1884, XIV, p. 325.

Japan and Persian Gulf (Smith).

Daphnella fragilis Reeve. C. Icon., f. 179.

Japan (Smith).

Daphnella fuscobalteata Smith. P. Z. S., 1879, p. 196, pl. 19, f. 26 ("fuscolineata" Dkr., Index, p. 25).

Betw. Nippon and Shikoku (St. John).

Daphnella saturata Reeve. C. Icon., I, f. 213; P. Z. S., 1879, p. 197.

North of Kiushiu (St. John).

Daphnella subzonata Smith. P. Z. S., 1879, p. 197, pl. 19, f. 27.

North of Kiushiu (St. John).

Daphnella supercostata E. A. Smith. Ann. Mag., 1882, X, p. 201.

Japan (A. Adams).

Taranis? turritispira E. A. Smith. Ann. Mag., 1882, X, p. 306.

Japan (Smith),

Mitromorpha lirata A. Ad. Ann. Mag. N. H. 1865, p. 322.

Simonosaki; Seto-Uchi (Ad.).

Zafra mitræformis A. Ad. Ann. Mag. N. H., Nov., 1860, p. 332.

Mino-Shima (A. Ad.).

CANCELLARIIDÆ.

Cancellaria spengleriana Deshayes. Challenger Gastrop., 1873-6, XV, p. 273; Ann. Mag., 1875, 425; Tryon, Man., Vol. VII, p. 67, pl. 1, f. 2, 3.

Shimidzu, Akasi, Mososeki (A. Ad., Ann. Mag., 1868, p. 368); Kobé, 8 fathoms, mud (Chall.); Lat. 35° 7′ N., long. 136° 55′ E.,

3 fath., soft mud (St. John); Nagasaki (Lischke); Inland Sea, etc. (Stearns).

Cancellaria asperella Lam. var. **reeveana** Crosse (=elegans Sowb. not Desh.). Rv., C. Icon., X, pl. 3, f. 12.

Yokohama (Stearns); Inland Sea (Dkr.); Kiusiu and Tokyo (Lischke); Seto-Uchi; Tomo (Ad.).

Cancellaria bocageana Crosse & Debeaux. Lischke, J. M. C., III, p. 41, pl. 2, f. 12, 13, 14.

Bay of Yedo (Lischke).

Cancellaria nodulifera Sowb. Dkr., Index, pl. 6, f. 24, 25. Conchyl. Cab., pl. 8, f. 1, 2.

Yokohama Bay (Stearns); Kino-o-Sima; Shimidzu (A. Ad.).

Cancellaria semipellucida Ad. & Rve. Zool. Samarang, p. 42, pl. 10, f. 3, 3a.

Mino-Shima, 63 fms. (A. Ad.).

Cancellaria macrospira Ads. & Rve. Zool. Samarang, p. 41, pl. 10, f. 2.

Mino-Shima (Ad.).

Cancellaria fischeri A. Adams. Ann. Mag. N. H., 1868, p. 368.

Mino-Shima (Ad.).

Admete viridula Fabric. Man. Conch., VII, p. 84.

Aniwa Bay, 17 fms. (Ad.); Castle Point, Manchuria.

Admete arctica Midd. Mal. Rossica, pl. 9, f. 12. A. borealis Ad., Ann. Mag., Nov., 1868, p. 369.

Aniwa Bay (Ad.).

Admete japonica Smith. P. Z. S., 1879, p. 216, pl. 20, f. 54.

Corea Strait (St. John).

Admete ovata E. A. Smith. Ann. Mag., 1875, p. 426.

Lat. 42° 52′ N., Long. 144° 40′ E., 48 fathoms (St. John).

Admete globularis E. A. Smith. Ann. Mag., 1875, p. 426.

Lat. 42° 52′ N., Long. 144° 40′ E., 48 fath., sandy bottom (St. John).

Admete cancellata Kobelt. Conchyl. Cab., p. 105, pl. 24, fig. 14.

Japan.

(*Rhachiglossa*).

OLIVIDÆ.

Oliva sanguinolenta Lamarck. Man. Conch., V, p. 79.

Japan (Rein).

Oliva ispidula Linné. Thes. Conch., IV, f. 240–254.

Japan.

Oliva mustelina Lamk. Ann. Mag., 1875, p. 426; C. Icon., f. 23.

Nagasaki (Lischke); Inland Sea (Stearns).

Oliva rufopicta Weinkauff. Conchyl. Cab., p. 88, pl. 23, f. 11, 12.

Japan (Loebbecke).

Oliva paxillus Reeve. Japan.

Oliva elegans Lam. Thes. Conch., f. 158–160.

Nagasaki (Lischke).

Oliva irisans Lam. Thes. Conch., f. 123.

Japan (Dkr.); Inland Sea (Stearns; with var. *erythrostoma*).

Oliva carneola Lam. Thes., f. 233–235.

Japan (Dkr.).

Oliva tessellata Lam. Thes., f. 222–224.

Japan (Dkr.).

Oliva picta Rve. C. Icon., f. 79.

Japan.

Olivella jaspidea Gmel. Japan (Dkr.).

Olivella anazora Duclos. Thes., f. 419.

Nagasaki (Lischke); Castries Bay (Nordmann).

Olivella tergina Duclos. Ducl., Oliva, pl. 2, f. 13–16.

Northern Japan (Schrenck).

Olivella zanoeta Duclos. Thes., f. 404.

Japan (Dkr.).

Several of the Olivellas named above are probably admitted to the Japanese fauna on insufficient evidence or incorrect identification. Schrenck gives *O. gracilis* B. & S. and *O. dama*, from the Bay of Castries, both probably incorrect. The following are unquestionably Japanese.

Olivella fulgurata Ads. & Rve. Zool. Samarang, p. 31, pl. 10, f. 12; Smith, Ann. Mag., 1875, p. 426; +O. consobrina Lischke, J. M. C., II, p. 62, pl. 5, f. 10, 11.

Yamada Harb., 7 fath., sand (St. John); Tokyo Harbor; Kamakura (Stearns); Nagasaki (Lischke); N. coast of Tango (Gaines).

Olivella fortunei (Ad.) Marratt. Pl. II, fig. 11.

Thes. Conch., IV, pl. 350, f. 422, 423.

Marratt's figures but poorly represent the magnificent specimens procured by Mr. Stearns. The large dark form shown in the figure may be called var. *japonica* Stearns.

Olivella signata Lischke. J. M. C., p. 44, pl. 2, f. 26, 27.

Yedo (Lischke).

Olivella spreta Gld. Smith, P. Z. S., 1879, p. 216, pl. 20, f. 55.

E. of Goto Is. (St. John).

Olivella fabula Marratt. Thes. Conch., IV, pl. 350, f. 420, 421.

The specimens collected by Mr. Stearns while agreeing perfectly with typical *fabula* in the peculiar parietal callus, are somewhat stouter, less attenuated above and fuller in the body than a specimen of *fabula* before me from Mr. Marratt. The basal callus is white, or in one shell slightly brownish. Alt. 11·5, diam. 5 mm.

I believe this quite distinct from *O. fulgurata.*

Ancilla albo-callosa Lischke. J. M. C., III, p. 44, pl. 2, f. 24, 25.

Nagasaki (Lischke); Deshima (Nuhn); East coast Japan above Inland Sea (Stearns).

Ancilla inornata Smith. P. Z. S., 1879, p. 217, pl. 20, f. 56.

Japan. Dunker identifies also *A. montrouzieri* Souv. a New Caledonian species.

HARPIDÆ.

Harpa conoidalis Lam. C. Icon., sp. 7.

Japan (Dunker).

Harpa minor Lam. Japan (Stearns.)

MARGINELLIDÆ.

Marginella sexplicata Dkr. M. obtusa Sowb., P. Z. S., 1870, p. 254, not in Thes., p. 374.

Japan (Dkr.).

VOLUTIDÆ.

Voluta megaspira Sowb. Thes., p. 298, f. 31, 32.

Bay of Yedo (Lischke); Bay of Hakodate (Ad.); Inland Sea (Stearns).

Voluta rupestris Gmel. Nagasaki (Lischke); Mino-Shima (A. Ad.).

Voluta hamillei Crosse. Journ. de Conch.., XVIII, p. 97, pl. 1, f. 5; pl. 2, f. 1.

Voluta vespertilio Linn. Japan (Dkr.).

Voluta concinna Brod. C. Icon., f. 53.

Japan Sea (Dkr.).

Lyria cassidula Reeve. Dkr., Index, pl. 2, f. 10–13.

Nemoto, Boshiu (Stearns); Nagasaki (Lischke); Kino-o-Shima, Tsu-Saki and Satanomosaki (A. Ad.); N. coast of Prov. Tango (Gaines, in Stearns coll.).

Lyria nucleus Lam. C. Icon., f. 41.

Tatiyama and Okino-Shima (Ad.).

Volutomitra pusilla Schrenck. Moll. Amurl., p. 445, pl. 17, f. 13–15.

Hakodate (Schrenck).

MITRIDÆ.

Mitra hanleyana Dkr. Index, p. 51, pl. 2, f. 6, 7. (M. wrighti Cr., J. C., 1878, pl. 1. f. 1).

Sea of Japan (Dkr.); Inland Sea (Stearns).

Mitra rosacea Rve. C. Icon, f. 321. Japan.

Mitra flammigera Reeve. C. Icon., f. 173.

Japan (Dkr.).

Mitra ferruginea Lam. Nagasaki (Lischke; Stearns).

Mitra amphorella Lam. Dkr., Moll. Jap., p. 8. Japan.

Mitra scutulata Chemn. C. Icon., f. 126.

Nagasaki (Lischke).

Mitra cruentata Chemn. C. Icon., f. 126. Japan (Dkr.).

Mitra bronni Dkr. Index, pl. 5, f. 5, 6. (M. fuscoapicata Smith, P. Z. S., 1879, pl. 20, f. 49).

E. of Kii, 48 fms.; Ooshima Harbor (St. John).

Mitra subtruncata Sowb. Thes., pl. 360, f. 405; P. Z. S., 1879, p. 214.

Ooshima Harbor, 8 fms. (St. John).

Mitra secalina Gld. Otia Conch., p. 129.

Ooshima (Stimpson).

Mitra (Costellaria) suluensis Ads. & Rve. Ann. Mag., 1875, p. 425; Voy. Samarang, p. 26, pl. 10. f. 27.

Ooshima Harb., 8 fath., sandy mud (St. John).

Mitra (Costellaria) araneosa Lam. Japan (Stearns).

Mitra collinsoni A. Adams. Smith, P. Z. S., 1879, p. 218, pl. 20, f. 50.

E. of Goto Is.; Ooshima; Matoza Harbor (St. John); Kino-o-Shima (Ad.).

Mitra gotoensis Smith. P. Z. S., 1879, p. 215, pl. 20, f. 51.

Goto Is. (St. John).

Mitra pyramidella A. Ad. Ann. Mag. N. H., Apr., 1862, p. 297.

Satanomosaki (Ad.).

Mitra kraussii Dkr. Index, p. 53, pl. 5, f. 11, 12.

Prov. Kii; Suruga (Stearns); Nagasaki (Lischke); Deshima (Nuhn); Hakodate (Schrenck).

Mitra æmula Smith. P. Z. S., 1879, p. 215, pl. 20, f. 52.

Goto Is. (St. John).

Mitra inermis Reeve. Smith, P. Z. S., 1879, p. 216, pl. 20, f. 53, 53a,

Ojica Bay, Goto Is., 5 fms. (St. John).

Mitra porphyretica Reeve. C. Icon., sp. 195.

Japan (Dkr.).

Cylindromitra crenulata Chemn. C. Icon., f. 190a.

Nagasaki (Lischke).

[One specimen of *Mitra pontificalis* was obtained by Mr. Stearns, but it was probably imported].

FASCIOLARIIDÆ.

Fusus nodosoplicatus Dunker. Lischke, Jap. Meeres-Conch., II, p. 27. pl. 3, f. 6. Novit Conch., p. 99, pl. 33, f. 3, 4.

Nagasaki (Lischke); Ukushima, Goto Is. (St. John).

Fusus nicobaricus Lam. Rve., C. Icon., IV, f. 37.

Nagasaki (Lischke); Japan (Stearns).

Fusus perplexus A. Adams. Ad.. Journ. Linn. Soc., 1864, VII, p. 106. (*F. inconstans* Lischke, Jap. Meeres-Conch., I, pl. 2, f. 1–6; II, pl. 3, f. 1–5).

Yedo and Nagasaki (Lischke); Sagami Bay (Stearns); near Goto Is., (St. John).

Fusus longicauda Bory. C. Icon., IV, f. 13.

Japan (Dkr.).

Fusus tuberosus Reeve. Reeve, Conch. Icon., IV, f. 7.

Nagasaki (Lischke); Japan and Loo Choo Is. (Stearns).

Fusus nigrirostratus E. A. Smith. Smith, P. Z. S., 1879, p. 202, pl. 20, f. 34.

South of Corea (St. John).

Fusus japonicus Gray. Zool. Beechey's Voy., p. 115.

Japan Sea.

Fusus spectrum Ads. & Reeve. Zool. Samarang, p. 41, pl. 7, f. 2.

Nagasaki, Hakodate (Schrenck).

Fusus lacteus Dkr. Index, p. 12, pl. 3, f. 11, 12.

Japan Sea (Loebbecke coll.).

Fusus niponicus E. A. Smith. Smith, P. Z. S., 1879, p. 203, pl. 20, f. 12.

South of Nippon, 52 fms. (St. John).

Fusus simplex E. A. Smith. Smith, P. Z. S., 1879, p. 204, pl. 20, f. 35.

South of Corea, 24 fms. (St. John).

Fusus coreanicus Smith. L. c., p. 204, pl. 20, f. 36.

South of Corea (St. John).

Fusus sieboldi Schepman. Notes Leyd. Mus., XIII, p. 62, pl. 9, fig. 3.

Japan (Siebold).

Fusus graciliformis Sowerby. Thes., IV, pl. 411, fig. 62.

Japan (Sowb.).

Fusus forceps Perry (**turricula** Kien). Thes., IV, pl. 408, fig. 24.

Japan (Sowb.).

Fusus modestus Gld. Otia Conch., p. 121.

Hakodate, 10 fathoms, shelly sand (Stimpson).

Fasciolaria trapezium Linn.

Inland Sea. The elongated form, var. *audouini* Jonas, also collected by Stearns. Lischke reports it from Nagasaki.

Fasciolaria filamentosa Chemnitz. Conchyl. Cab., p. 136, pl. 24. fig. 1.

Hakodate and Takano Shima (Ad.).

Fasciolaria glabra Dkr. Index, p. 48, pl. 12, f. 15, 16.

Japan (Dkr.).

Latirus polygonus Gmel. Rve., Conch., Icon. Turbinella, f. 1.

Tatiyama (Ad.).

Latirus rhodostoma Dkr. Moll. Jap., p. 4, t. 1, f. 21.

Deshima (Nuhn); Nagasaki (Lischke).

Latirus belcheri Reeve. Reeve, C. Icon. Turbinella, f. 22.

Japan (Stearns).

Latirus nagasakiensis Smith. P. Z. S., 1880, p. 482, pl. 48, f. 7.

Japan (Maries).

Latirus recurvirostris Schub. & Wag.

A single large fresh specimen collected by Stearns, East Coast.

Lagena smaragdula Linn. Yokohama (Stearns).

Peristernia pulchra Reeve. Kominah, Boshiu (Stearns).

BUCCINIDÆ.

Hemifusus ternatanus Gmel.

Yokohama; Tokyo to Kii coast (Stearns). Several fresh specimens with opercula.

Hemifusus tuba Gmelin. Conchyl. Cab., p. 41, pl. 7, f. 1, 2.

Nagasaki (Schrenck, A. Ad., Lischke); Deshima (Nuhn); Hakodate, Tatiyama, Tsu-Shima (A. Ad.).

Thatcheria mirabilis Angas. P. Z. S., 1877, pl. 54, f. 1.

Japan (Thatcher).

Chrysodomus arthriticus (Val.) Bernardi. Bern., Journ. de Conchyl., 1857, p. 386, pl. 12, f. 3, 3a.

Hakodate (Bernardi; Stearns).

The specimens are smaller than Bernardi's figure, but undoubtedly the same. When not corroded the color is dark brown.

Neptunea cumingi Crosse. J. de C., 1862, p. 51, pl. 5, f. 12.

Bay of Talienwhan (Cuming).

Very closely allied to *C. arthriticus*, of which it is probably a variety.

Chrysodomus bulbaceus (Val.) Bernardi. Journ. de Conch., 1858, p. 183, pl. 7. f. 1.

Gulf of Tartary (Bern.).

The next species is very closely allied to this.

Chrysodomus luridus A. Ad. Dkr., Index, p. 14, pl. 3, f. 3, 4.

Aniwa Bay; Cape Tofuts (Ad).

Chrysodomus antiquus var. **despectus** Linné. Conchyl. Cab., p. 56, pl. 27, f. 1–5.

Bay of Yedo (Lischke).

Both *antiquus* and *despectus* have been credited to northern Japan. We have not seen Japanese specimens.

Chrysodomus plicatus A. Ad. Dkr., Index, p. 14, pl. 3, f. 1, 2; Kob., Conch. Cab., pl. 12, f. 4, 5.

Aniwa Bay (Ad.).

Chrysodomus (?) **manchuricus** E. A. Smith. Ann. Mag., 1875, p. 422.

Lat. 42° 58′ N., long. 145° 24′ E., 48 fath., sand and mud (St. John).

Chrysodomus pericochlion Schrenck. Conchyl. Cab., p. 131, pl. 43, f. 4, 5.

Hakodate (Albrecht).

Siphonalia signum Reeve. C. Icon., III, f. 6; Dkr., Index, p. 15, pl. 3, f. 9, 10.

South Japan (Rein); Ooshima, Hakodate (A. Ad.).

Siphonalia hinnulus Ad. & Rve. A. & R., Zool. Samarang, p. 32, pl. 7, f. 10; Dkr., Index, p. 16.

Tsu-Saki, 35 fms.; Tatiyama (A. Ad.).

Siphonalia cassidariæformis Reeve. Rve., C. Icon. *Buccinum*, f. 11; Lischke, J. M. C., I, pl. 4, f. 1, 2, 6–10.

Enoshima (Stearns); Nagasaki (Lischke); W. coast Japan, and Hakodate (Stimp.); O-Shima and Simoda (A. Ad.); Goto Is. (St. John).

Lischke's figures represent the principal variations of this species, of which Mr. Stearns procured a large number of specimens.

Siphonalia cassidariæformis var. **ornata** A. Ad. Dkr., Index, p. 16; Lischke, J. M. C., I, pl. 4, f. 3, 4, 5.

S.-E. coast Kii, Inland Sea (Stearns).

Siphonalia cassidariæformis var. **concinna** A. Ad. Ad., Ann. Mag. N. H. (3), XI, p. 204, 1863; Lischke, J. M. C., I, p. .

Kuro-Shima (A. Ad.).

Siphonalia cassidariæformis var. **funerea** Pils. Pl. II, f. 7, 8.

Satsuma (Stearns).

Shell like the type except that the nodules are reduced to short oblique waves somewhat as in *Buccinum undatum*, and the color outside is uniform chocolate-brown. Interior strongly lirate, dark brown with a pearly lustre.

This seems distinct from any of A. Adams' species.

Siphonalia fusoides Reeve. Conch. Icon., Buccinum, pl. 2, f. 9; Conchyl. Cab., p. 88, pl. 23, f. 6–7.

Tokyo Bay (Lischke); Satanomosaki and Tsu-Shima (A. Ad.); S.-E. coast Kii (Stearns).

A species resembling *S. cassidariæformis* but slenderer, with less prominent nodules.

Siphonalia spadicea Reeve. Buccinum fusoides Rve., C. Icon., pl. 9, f. 64, not pl. 2, f. 9; B. spadicea Rve., errata; Smith, P. Z. S., 1879, p. 205, pl. 20, f. 38.

Mino-Shima, 63 fms. (Ad.); Port Hamilton, 10 fms.; S. of Nippon, 34° 12′ N. lat., 136° 28′ E. long.; S. of Corea, 34° 19′ N. lat., 124° 57′ E. long., 12 fms. (Smith).

Siphonalia fuscolineata Pease. P. Z. S., 1860, p. 189, pl. 51, f. 3; Pilsbry, Proc. Acad. Nat. Sci., Phila., 1891, p. 473, pl. 19, f. 4.

Mino-Shima (A. Ad.); Inland Sea (Stearns).

The specimens vary much in color, some being decorated with brown spiral lines, others streaked and maculated with chestnut. It is allied to *S. fusoides* Rv., but the spire is much longer. The canal is more recurved than in *S. spadicea* Rve., which is otherwise quite similar.

Siphonalia æstuosa Gould. Gld., Otia, p. 123 (Neptunea).

Kagoshima (N. P. E. E.).

Siphonalia Stearnsii Pilsbry. Pl. II, f. 1, 2.

Shell fusiform, solid, brownish; spire conical, shorter than the aperture, consisting of 8 convex whorls, which are finely spirally

lirate, and *closely* and strongly plicate; plicæ becoming partly or wholly obsolete on the body-whorl, which is very indistinctly or not at all shouldered, and runs upward somewhat toward the aperture, causing a narrow, small posterior channel. Aperture shaped as in *S. fuscolineata* Pse. but wider, the inner lip smooth, its edge raised and free; outer lip with a wide yellow internal border, inside of which it is thick, lirate and white. Anterior canal strongly recurved, short. Alt. 46, diam. 25 mm. Oblique alt. of aperture 29 mm.

Allied to *S. longirostris* Dkr., but less elongated, with more strongly plicate spire and different aperture. I cannot see that any of A. Adams' unfigured species agree with the specimens before me. The spire is longer and more plicated than in *S. fusoides* Reeve, and the canal more recurved.

Siphonalia longirostris Dkr. Index, p. 16, pl. 1, f. 13, 14.

Sea of Japan (Dkr.).

Siphonalia trochulus Reeve. C. Icon., (Buccinum), f. 7.

O-Shima (Ad.).

Siphonalia modificata Reeve. C. Icon., f. 67.

Kuru-Shima, 56 fms.; Fatsijeu, 29 fms. (Ad).

Siphonalia commoda A. Ad. Ann. Mag. N. H. (3), xi, 1863, p. 203.

Tsaulian (Ad.).

Siphonalia corrugata A. Ad. *l. c.*, p. 204. Kino-o-Shima (Ad.).

Siphonalia conspersa A. Ad. l. c., p. 204. Japan (Cuming coll.).

Siphonalia filosa A. Ad. l. c., p. 205. China Sea (Ad.).

Siphonalia ligata A. Ad. l. c., p. 205. Japan (Cuming coll.).

Siphonalia grisea A. Ad. Simidzu (Ad.; l. c., p. 205).

Siphonalia colus A. Ad. Mino-Shima, 63 fathoms (Adams, l. c., p. 205).

Siphonalia acuminata A. Ad. Goto, 4–8 fathoms, (Adams, l. c., p. 206).

Siphonalia pyramis A. Ad. Satanomosaki, 55 fathoms (Adams, l. c., p. 206).

Siphonalia mucida A. Ad. Kuro-Shima, 35 fathoms (Adams, l. c., p. 206).

Siphonalia nodulosa A. Ad. Mino-Shima, 63 fathoms (Adams, l. c., p. 206).

Siphonalia (Kellettia) kelleti Forbes. Lischke, J. M.-C. pl. 3, f. 3, 4.

Nagasaki (Lischke); South-east coast Ise. (Stearns).

Siphonalia hyperodon n. sp. Pl. II, f. 6.

General contour of the shell as usual, the spire elongated, base much contracted, canal strongly recurved. Color dirty buff, with some

scattered maculæ of brown, especially below sutures, and sometimes ill-defined girdles. Whorls 9, the earlier two smooth, glossy, convex; the following five very convex, separated by deep sutures, sculptured with strong rounded longitudinal folds as wide as their intervals, about 11 to a whorl, these crossed by strong spiral cords separated by flat interspaces, about 6 on each whorl, becoming lower and more numerous below, wholly obsolete or nearly so on the latter two whorls of the shell. The lower 3 whorls are strongly angular at the shoulder, and on the last whorl the longitudinal folds are represented by strong, pointed tubercles on the angle, which number 10–12 on last whorl, the latter fifth of which is free from them. Aperture nearly half the length of shell, livid within, the upper angle narrowly sinused as in *Cantharus*, basal canal strongly recurved. Outer lip thickened outside by a low, wide varix, submargined by short, close plicæ within; inner lip moderately calloused, bearing near its posterior termination a very strong, rounded nodule. Umbilicus open; siphonal fasciole defined above by a free laminar edge.

Alt. 51, diam. 26 mm.

Alt. 43, diam. 21 mm.

Japan (Stearns, 3 specimens).

Distinguished from other species by the strong nodule on the inner lip near the posterior angle of aperture, defining a channel there. Although I have an impression that somewhere I have seen a specimen or figure of this species, I cannot now find that anything much like it has been described. A quite young specimen would probably resemble somewhat *Euthria fuscolabiata* E. A. Smith.

Buccinum lischkeanum Loebbecke. Conchyl. Cab., p. 35, pl. 80, f. 5, 6.

North Japan.

Buccinum schantaricum Midd. Sib. Reise, p. 233, pl. 10, f. 4–6.

Buccinum middendorffi Verkruzen. Kob., Conchyl. Cab., p. 76, pl. 89, f. 2.

Sachalin Is.

Buccinum simplex Midd. Kob., C. Cab., p. 77, pl. 89, f, 4, 5.

Buccinum verkruzeni Kobelt. Conchyl. Cab., p. 80, pl. 90, f. 1, 2.

Sachalin Is.

Buccinum schrenkii Verkruzen. Conchyl. Cab., p. 81, pl. 90, f. 3.

Sachalin; N. of Gulf of Geduld.

Buccinum mirandum Smith. Conchyl. Cab., p, 92, pl. 92, f. 4.

E. of Yedo, 11 fathoms.

Buccinum japonicum A. Adams. Conchyl. Cab., p. 91, pl. 92, f. 2.

Japan ; Okosiri (Adams).

Buccinum jeffreysii Smith. Conchyl. Cab., p. 91, pl. 92, f. 10.

Japan, lat. 42° 58′ N., long. 145° 24′ E., 48 fath., sand and stone.

Buccinum leucostoma Lischke. Lischke, J. M. C., III, p. 38, pl. 1, f. 7, 8.

Yokohama (Stearns) ; Bay of Yedo (Lischke).

Buccinum morchianum Fischer. (*Volutharpa*) Kob., C. Cab., p. 90, pl. 92, f. 8, 9.

Northern Japan.

Volutharpa perryi Jay. Conchyl. Cab., p. 95, pl. 93, f. 5, 6; pl. 92, f. 5. (*Volutharpa paulucciana* Tap.-Can, Journ. de Conch., 1882, p. 24, pl. 2, f. 3, 4).

Bay of Yedo (Perry, Stearns).

Volutharpa ampullacea Midd. Midd., Reise, Ost. Siber., II, p. 237, pl. 8, f. 3, 4; pl. 17, f. 1–3.

Bays of Aniwa and Hakodate, and northward (Midd., Ad., Albrecht, *et al.*) ; Lat. 41° 12′ N., Long. 140° 45′ E., 43 fath., sand and mud (St. John).

Volutharpa fischeriana A. Adams. Ad., Ann. Mag. N. H., 1870, V, p. 442.

Strait of Corea (Ad.),

Volutharpa limnæana A. Ad. Ad., Ann. Mag. N. H., 1860, VI, p. 109.

Japan.

Volutharpa salmiana Rolle. Nachrbl., 1892, p. 52.

Japan.

Cominella fucata A. Ad. Proc. Linn. Soc. III, 1862. p. 107.

Japan (Cuming Coll.).

Cominella lineolata Dkr. (= *dunkeri* Küster). Conchyl. Cab., 2d edit., p. 86, pl. 15, f. 9–11.

Hakodate (Schrenck, Dkr.). Described from the Cape of Good Hope, but Dunker believes the Japanese shells to be the same.

Cyllene pulchella Ads. & Rve. Zool. Samarang. pl. 10, f. 11.

Satanomosaki (Ad.).

Cyllene orientalis A. Ad. P. Z. S., 1850, p. 205.

Goto Is. (Ad.).

Cyllene glabrata A. Ad. Satano-Mosaki (Ad., *l. c.*, p. 206).

Cyllene fuscata A. Ad. Kuro-Shima (A. Ad., *l. c.*, p. 205; Thes., f. 16–18).

Cyllene gibba A. Ad. Oki-no-Shima (A. Ad., Ann. Mag. N. H., 1870, p. 427).

Tritonidea undosa Linné. Yokohama (Stearns).

Tritonidea undulata Schepman. Notes Leyd. Mus., XIII, p. 155, pl. 9, f. 1.

Japan (Siebold); N. shore of Tango (Gaines); Konimah, Boshiu (Stearns).

Some clear yellow specimens without brown lines were collected by Stearns.

Tritonidea protea Reeve. C. Icon., *Buccinum*, f. 51.

Nagasaki (Lischke); Tsu-Shima (A. Ad.).

Tritonidea lignea Rve. C. Icon., *Buccinum*, f. 57.

Nagasaki (Lischke); Seto-uchi (A. Ad.).

Tritonidea (Cantharus) cumingiana Dkr. Index, p. 18 (Syn.: *Buccinum ligneum* Rve., C. Icon., f. 57).

Seto-uchi (Ad.); Nagasaki (Lischke).

Tritonidea (Cantharus) balteatus Reeve. (C. Icon., *Bucc.*, f. 59), is a variety of this according to Dunker. Tryon makes both synomyms of *Cantharus cecillei* Phil. Tateyama (Ad.).

Tritonidea (Cantharus) contracta Reeve. C. Icon., f. 53; Lischke, J. M. C., II, p. 50.

Nagasaki (Lischke).

Tritonidea (Cantharus) menkeana Dkr. Dkr., Moll. Jap., p. 7, pl. 1, f. 7.

Deshima (Nuhn); Nagasaki (Lischke).

Tritonidea (Cantharus) subrubiginosa E. A. Smith. Smith, P. Z. S., 1879, p. 206, pl. 20, f. 40.

Ukushima, Goto Is., among rocks at low water (St. John).

Tritonidea (Cantharus) marmorata Reeve. C. Icon., III, *Buccinum*, f. 95; Schr., Amurl. Moll., p. 427.

Hakodate (Lindholm).

Tritonidea (Cantharus) erythrostoma Reeve. Rve., C. Icon., f. 14.

Ooshima (Ad.).

Tritonidea (Cantharus) capensis Dkr. Japan (Dkr.).

Pisania cingulata Reeve. Reeve, Conch. Icon., *Buccinum*, f. 75.

Luchu Is.

Pisania mollis Gould. Gld., Otia, p. 124.

Simoda (Stimpson).

Euthria ferrea Reeve. (*viridula* Dkr., Index, p. 19, pl. 3, f. 5–8; J. M. C., I, p. 39, pl. 5, f. 5, 6.)

Japan, Lat. 41° 12′ N., Long. 140° 45′ E., 43 fms.; Satsuma Bay. S. Kiu-Shiu and Goto Is. (St. John); many specimens collected by Stearns, at Enoshima; Tsu-Shima, O-Shima and Nagasaki (Ad.),

Euthria fuscolabiata E. A. Smith. Ann. Mag., 1875, p. 422.

Off Cape Blunt, Lat. 41° 41′ N., Long. 141° E., 35 fms., (St. John).

Euthria lirata A. Adams. Conchyl. Cab., p. 233.

Tsusaki (Adams).

Euthria badia A. Adams. Conchyl. Cab., p. 233.

Tsu-Shima (Adams).

Phos senticosus Linné. Japan (Dkr.).

Phos varicosus Gld. Expl. Exped., f. 360.

Japan (Dkr.).

Phos angulatus Sowb. Thes., iii, p. 89, pl. 221, f. 7; Challenger Gastrop., XV, p. 222.

Japan (Siebold).

Nassaria (=**Hindsia**) **magnifica** Lischke. Jap. Meeres-Conchyl., II, p. 38, pl. 4, f. 11, 12; III, pl. 1, f. 5, 6. Dkr., Index, p. 38.

Sagama (Stearns); Kiusiu (Lischke).

Eburna japonica Sowb. Deshima (Nuhn); Nagasaki (Lischke); Sado, Tokyo Harbor, Kamakura (Stearns); Tsu-Saki, Tatiyana, Simoda (Ad.); Hakodate (Schrenck).

Eburna formosæ Sowb. Thes., III, pl. 291, f. 17, 18.

Formosa.

NASSIDÆ.

Nassa balteata Lischke. *N. balteata* Lischke not Pse., see J. M. C., II, p. 51; *N. japonica* Lischke not A. Ad., Jap. M. C., 1, p. 61, pl. 5, f. 10, 11; (*N. mutabilis* A. Ad.? Ann. Mag., 1870, p. 425).

Yokohama (Stearns); Nagasaki (Lischke).

Nassa suffiata Gld. Otia Conch., p. 127.

Kagoshima (Stimpson).

Nassa coronata Lam. C. Icon., f. 20.

Japan (Stearns).

Nassa (**Alectrion**) **glans** Linné. C. Icon., f. 5; P. Z. S., 1879, p. 210.

W. of Goto Is. (St. John).

Nassa (**Alectrion**) **suturalis** Lam. Yokohama (Stearns, purchased).

Nassa (**Alectrion**) **papillosa** L. Yokohoma (Stearns, purchased).

Nassa (**Arcularia**) **thersites** Brug. Japan (Dkr.).

Nassa (**Arcularia**) **gracilis** Pease. Am. Journ. Conch., III, p. 273, pl. 23, f. 4. Lischke, J. M. C., II, p. 52, pl. 4, f. 4–6.

Deshima (Nuhn); Nagasaki (Birileff).

Nassa (Arcularia) leptospira A. Ad.

Nassa (Niotha) gemmulata Lam. C. Icon., f. 29; Ann. Mag., 1875, p. 422.

Kii Coast (Stearns); Goza Harb., 6 fath. (St. John); Bay of Yedo (Lischke); Kagoshima (Stimp.).

Specimens of extraordinary size collected by Mr. Stearns.

Nassa (Niotha) gemmulifera A. Ad. Ann. Mag. N. H., 1870, p. 425; C. Icon., f. 132.

Seto-Uchi; Akasi; Kino-Oshima (Ad.). Near *N. albescens* Dkr.

Nassa (Niotha) stigmaria A. Ad. Ann. Mag., 1875, p. 423, C. Icon. f. 42; Syn. *N. densigranata* Rve., C. Icon., f. 181.

Ooshima Harbor, 8, fms.; E. of Goto Is. (St. John).

Nassa (Niotha) cumingii A. Ad. C. Icon., f. 30.

Takano-Shima, Tatiyama (Ad.).

Nassa (Niotha) marginulata Lamk. Ann. Mag., 1875, p. 422, C. Icon., f. 43.

Ooshima Harb., 8 fath., and a variety from Yamada Harb. (St. John); Satanomosaki (Ad.).

Nassa (Niotha) cælata A. Ad. C. Icon., sp. 133.

Moso-Seki; Seto-Uchi (Ad.).

Nassa (Niotha) livescens Phil. Lischke, J. M. C., II, p. 52, pl. 4, f. 1–3.

Tokyo Harbor; Kiushiu (Stearns); Nagasaki and Deshima (Lischke).

Is not the *N. keineri* Dh. (Tryon, Man. Conch., IV, p. 53) synonymous with this? The large number of specimens obtained by Mr. Stearns fully connect the forms.

Nassa (Niotha) albescens Dkr. Phil., Abbild., p. 68, pl. 2, f. 15 (Buccinum).

Deshima (Dkr.).

Nassa (Hebra) muricata Q. & G. Astrol., pl. 32, f. 32, 33.

Okino-Shima, Tsaulian (Ad.); Japan (Stearns).

Nassa (Hima) festiva Powis. Dkr., Moll. Jap., pl. 1, f. 22, *N. lirata, vide* Lischke, J. M. C., II. p. 53.

Kiushiu, Inland Sea (Stearns); Nagasaki and Deshima (Lischke); Hakodate (Ad.); Ukushima, Goto Is. (St. John).

Nassa (Hima) dealbata A. Ad. P. Z. S., 1851, p. 112; C. Icon., f. 105.

Japan (Stearns). Probably a form of *N. festiva.*

Nassa fuscolineata E. A. Smith. Ann. Mag., 1875, p. 423.

Cape Shima, 18 fath., sand and broken shell (St. John); Tokyo Harbor (Stearns); N. shore of Prov. Tango (Gaines).

Nassa (Hima) japonica (A. Ad.) Lischke. P. Z. S., 1851, p. 110; Lischke, J. M. C., III, p. 37, pl. 2, f. 20–23. *N. tenuis* Smith, Ann. Mag., 1875, p. 423; P. Z. S. 1879, p. 211.

Cape Shima, 18 fms.; Goza and Ooshima Harbors; between Nippon and Shikoku (St. John); Bay of Yedo (Lischke); Seto-Uchi, Uraga, Kino-o-Shima, Sado (A. Ad.).

Nassa (Hima) dominula Tap.-Can. Viag. Magenta, p. 19, pl. 1, f. 17. (Syn.: *N. acutidentata* Smith, P. Z. S., 1879, p. 212, pl. 20, f. 46).

Yokohama (Magenta); Goto Is. (St. John).

Nassa (Hima) luteola Smith. P. Z. S., 1879, p. 212, pl. 20, f. 47.

Goto Is. (St. John).

Nassa (Hima) fraterculus Dkr. Moll. Jap., p. 17, pl. 1, f. 15. J. M. C., II, pl. iv, f. 7, 8.

Isi, Kamakura, Tokyo Harbor (Stearns); Goto Is. (St. John); Tatiyama, Hakodadi, Simoda, Nagasaki (Ad.); Deshima (Nuhn).

Nassa (Hima) plebecula Gld. Otia Couch., p. 128.

Ooshima (Stimpson); considered by Lischke a synonym of *N. fraterculus*..

Nassa mustelina Gld. Otia Conch., p. 127.

Ooshima Coast, 2 fathoms; (Stimp.).

Nassa spurca Gould. Ann. Mag., 1875, p. 423; Otia, p. 129.

Ooshima and Yamada Harb., 7–8 fath., (St. John).

Is the Japanese shell really Gould's species?

Nassa dermestina Gld. Proc. Bost. Soc. vii, p. 331; Otia, p. 128.

Hakodate (Lischke, J. M. C., 1, p. 60); Kikaia (Stimp.).

Nassa (Zeuxis) siquijorensis A. Adams. C. Icon., f. 53; P. Z. S., 1879, p. 210, pl. 20, f. 45, 45a.

Off Kobé, 8 to 14 fath., mud (Chall.); Seto-Uchi, Tsaulian, Tomo (Ad.); E. of Kii (St. John).

Nassa (Zeuxis) crenulata Brugiére. Challenger Gastrop, 1873–6. XV, p. 183; Reeve. Conch. Icon., VIII, pl. 1, f. 2.

Off Kobé, 8 fms. (Challenger).

Nassa (Zeuxis) varicifera A. Ad. C. Icon., f. 118.

Isi, Kamakura (Stearns); Tsaulian (Ad.); South of Corea (St. John).

Stearns' shells are a small form which may be called var. *fratermminor*, characterized by the shell having only one varix which is near the end of the penultimate whorl, and otherwise resembling *N.*

fraterculus. They may indeed have no especial relationship to *varicifera*, as I have not been able to compare typical specimens of that species.

Nassa (Zeuxis) succincta A. Ad. C. Icon., f. 80.

Seto-Uchi, Mososeki (Ad.).

Nassa (Zeuxis) micans A. Ad. P. Z. S., 1851, p. 106; C. Icon., f. 140; Ann. Mag., 1870, V, p. 426.

Uraga (A. Ad.).

Nassa (Zeuxis) clandestina A. Ad. Ann. Mag. N. H. (4), V, p. 426.

Seto-Uchi, Idzuma-Nada, Yobuko (A. Ad.).

Nassa luctuosa A. Ad. C. Icon., f. 109.

Nagasaki (Lischke).

Nassa hypolia Pilsbry. Pl. II, figs. 13, 14.

Shell elongated, solid and thick, purplish-black with a peripheral brown or whitish girdle, not glossy; becoming ashy on the spire and with age all over. Surface dull; sculptured with numerous rounded longitudinal ribs, slightly curved, a trifle more prominent at the shoulder and not extending below the periphery, sometimes subobsolete on the body-whorl. No spiral sculpture, or a few faint cords at the base. Aperture less than half the shell's length. Outer lip with a low varix, thick, with five teeth within; throat purple-black, showing the narrow light band, which on the lip spreads upward; below it another light blotch on the lip. Columella with a white or yellow callus below, roughened by a few weak folds, and with the usual posterior fold. Alt. 12·5, diam. 7 mm. Operculum oval with entire edge.

Yesso (Stearns).

The folds are coarser and extend further down than in *luctuosa* and *succincta; semiplicata* is more strongly varixed with different denticulation of the aperture; *teretiuscula* differs in texture and color. This species would have been included by Tryon in *N. gaudiosa* judging from what he has considered synonyms of that species; but I am by no means prepared to endorse such wholesale lumping of species as that in his monograph of *Nassa*.

Nassa (Demoulia) binominata Pilsbry (n. n.).

Desmoulea japonica A. Ad. (not *Nassa japonica* A. Ad.). Reeve, Conch. Icon., *Nassa*, fig. 192.

Japan (A. Ad.).

On the subgenus *Demoulia* see E. A. Smith, Ann. Mag. N. H. (6), VIII, p. 320. No other species is known from Japan.

COLUMBELLIDÆ.

Columbella hæmastoma Sowb. Thes., I, p. 111, pl. 36, f. 5.

Gulf of Tartary (Schrenck).

Columbella fuscata Sowb. Ibid, p. 114, pl. 36, f. 21, 25.

Same locality. These are doubtful members of the Japan fauna.

Columbella solidula Reeve. C. Icon., sp. 149. Same locality.

Columbella scripta Lam. (**versicolor** Sowb.). Rve., Conch. Icon., f. 51; Thes., f. 41–46.

Oshima (Challenger); Tokyo Harbor (Stearns); Deshima, Nagasaki (Dkr.); Ukushima, Goto Is. (St. John).

Columbella pardalina Lam. var. **sagena** Reeve. Rve., Conch. Icon., pl. 26, f. 162; Lischke, J. M. C., III, pl. 2, f. 5–7.

N. shore of Tango (Gaines); Inland Sea (Stearns); Ukushima, Goto Is., E. coast Kii (St. John); Nagasaki (Lischke).

Tryon considers *Col. japonica* Rve. (C. Icon., f. 45) a form of *pardalina*.

Columbella araneosa Gld. Otia Conch., p. 132.

Kagoshima Bay (Stimpson).

Columbella tenuis Gaskoin. Ann. Mag., 1875, p. 422.

Endermo Harbor, 4–7 fath., sandy mud (St. John).

Columbella misera Sowb. J. M. C., I, p. 59; II, p. 48; III, p. 45, pl. 2, f. 10, 11.

Nagasaki (Lischke); Goto Is. (St. John); Kamakura, Isi and Tokyo Harbor (Stearns); N. shore of Tango (Gaines).

Columbella pumila Dkr. Moll. Jap., pl. 1, f. 4.

Tokyo Harbor and Kamakura (Stearns); Deshima (Dkr.); Nagasaki (Lischke).

Columbella martensi Lischke. J. M. C., II, pl. v, f. 1–9.

Nagasaki (Lischke); Tokyo Harbor (Stearns).

Columbella compta Lischke. J. M. C., II, p. 35, pl. 2, f. 8, 9.

Nagasaki (Lischke); Tokyo Harbor and Kamakura (Stearns).

Columbella (Atilia) niveomarginata Smith. P. Z. S., 1879, p. 208, pl. 20, f. 42.

Ukushima, Goto Is. (St. John).

Columbella (Atilia) lischkei Smith. P. Z. S., 1879, p. 207, pl. 20, f. 41.

North of Kiushiu, 30 fms. (St. John).

Columbella (Atilia ?) pleurotomoides n. sp. Pl. I, f. 6.

Shell fusiform, slender, smooth except for slight growth-lines, and on base and anterior canal numerous spiral liræ. Spire straight-sided, the sutures linear; whorls 9, flat, the body whorl swollen in the middle, rapidly contracted below into a short anterior canal. Surface not shining; light clear buff, showing under a lens close, faint, darker longitudinal lines, becoming flesh-colored on spire, the earliest whorls crimson; body whorl encircled by two girdles of small, close, lunate or squarish brown spots, one on base, the other above the periphery and ascending the spire about midway between sutures. Aperture, small, narrow, contained nearly $2\frac{1}{2}$ times in length of shell, smooth and showing the dot-series within; outer lip thin, sharp and simple, distinctly retracted above and arched forward in the middle. Columella sinuous, being prominent in the middle, concave above and below, without folds or teeth. Alt. 11, diam. $3\frac{1}{2}$ mm.

Banda, Boshiu (Stearns).

The generic reference of this beautiful species is by no means certain, as the outer lip lacks the teeth within characteristic of *Atilia*, and is distinctly retracted above. Numerous specimens were collected.

Columbella (Anachis) californica Reeve. Conchyl. Cab., p. 59, pl. 8, f. 3, 4.

Japan (Dr. Guttsche).

Columbella (Zafra) zonata Gld. Otia Conch., p. 130.

Kagoshima (Stimpson).

Columbella (Anachis) minuscula Gld. Otia Conch., p. 131.

Ooshima (Stimpson) 2 vars.

Columbella impolita Sowb. Thes. Conch., p. 132, f. 127.

Suruga, Kii coast (Stearns).

Columbella (Zafra) subvitrea Smith. P. Z. S., 1879, p. 209, pl. 20, f. 43.

South of Nippon (St. John).

Columbella (Zafra) mitriformis A. Ad. Ann. Mag., VI, 1860, p. 332.

Mino-Shima, 63 fms. (Ad.).

Columbella discors Gmel. Conchyl. Cab., p. 18, pl. 2, figs. 17–18.

Nagasaki (Lischke).

Columbella (Conidea) flava Brug. Lischke, J. M. C., III, pl. 2, f. 1–4.

Kii, Kamakura (Stearns); Deshima (Dkr.); Goto Is. (St. John); Nagasaki (Lischke).

Mr. Stearns' shells are the form figured by Lischke, which he finally referred to *C. undata* Duclos as a variety. Beach-worn specimens are fleshy-pink, with a row of narrow brown spots below the suture.

Amycla varians Dkr. Mal. Bl. VI, p. 231; Moll. Jap., p. 6, pl. 1, f. 17; P. Z. S., 1879, p. 210, pl. 20, f. 44.

Tokyo Harbor, Kamakura, Yokohama (Stearns); Nagasaki (Lischke); Deshima (Nuhn); Tatiyama, Hakodate, Rifunsiri (A. Ad.); N. shore of Tango (Gaines).

Amycla burchardi Dkr. Index, p. 55, pl. 4, f. 3, 4.

Amycla gausapata Gld. and *A. achatina* Sowb. are reported from Japan by A. Adams, Ann. Mag. N. H., 1870, p. 426.

Engina acuminata Reeve. C. Icon., sp. 52 (*Ricinula*).

Tsu-Shima (Ad.).

Engina mendicaria Linné. Japan (Dkr.; Stearns).

Engina trifasciata Reeve. C. Icon., sp. 41. *Pusiostoma trifasciatum* Ad.

Okino-Shima (A. Ad.).

Aesopus japonicus Gld. Otia Conch., p. 128.

Kagoshima Bay, 5 fathoms, sand (Stimpson).

MURICIDÆ.

Trophon lamellosum Gray. Ann. Mag., 1875, p. 421.

Japan, Lat. 42° 58′ N., Long., 145° 24′ E., 48 fms. (St. John).

Trophon incomptum Gld. Otia Conch., p. 125.

Hakodate (Stimpson).

Trophon inermis Sowerby. Conchyl. Cab., p. 287, pl. 71, f. 12.

Japan Coast (Siebold).

Trophon candelabrum Rve. Conch. Icon., f. 79 (Fusus).

Tsusaki, 55 fathoms (Adams).

Trophon concinnum A. Adams. P. Z. S., 1862, p. 375.

Rifunsiri (Adams).

Trophon tantillum A. Adams. Ibid. Satanomosaki (Adams).

Trophon clathratus Linné. Sachalin Island (Schrenck); E. coast of Prov. Kii (Stearns).

Trophon luculentus Rve. C. Icon., (*Murex*), sp. 127; Index, p. 9, pl. 1, f. 3, 4. (*T. fimbriatus* Hinds, voy. Sulphur, pl. 1, f. 18, 19).

Trophon pachyraphe Smith. P. Z. S., 1879, p. 205, pl. 20, f. 37, 37a. (*Fusus*).

Ukushima, Goto Is., and N. of Kiushiu (St. John).

Trophon crassum Ad. P. Z. S., 1851, p. 269. (*Murex*).

Hakodate.

Trophon crispum Gld. U. S. Expl. Exped., p. 229, f. 279. (*Fusus*).

Trophon orpheum Gld. Ibid, p. 234, f. 285. (*Fusus*).

Okosiri (Ad.).

Typhis arcuatus Hinds (**T. japonicus** A. Ad.). Zool. Sulphur, p. 10, pl. 3, f. 1, 2; Conch. Icon., XIX, pl. 3, f. 10, a, b, c.

Japan (Adams).

Typhis montforti A. Ad. Conch. Icon., Vol. 19, pl. iii. f. 15.

Okino-Shima (Adams).

Murex tenuispina L. Kii Coast (Stearns); Oshima, Nagasaki (Lischke).

Murex tribulus Linné. Simidzu (Ad.).

Murex aduncospinosus (Beck) Reeve. Yokohama (Dkr.).

Murex martinianus Rve. Japan (Dkr.).

Murex troschelii Lischke. Lischke, J. M. C., I, pl. 1.

Kii coast (Stearns); Nagasaki (Lischke).

The primary spines are mostly longer than shown in Lischke's figures.

Murex sobrinus A. Adams. P. Z. S., 1879, p. 199, pl. 20, f. 30.

Satanomosaki, 55 fms.; Goto, 48 fms.; Kuru-Shima, 29 fms. (Ad.); W. of Goto Is. and S. of Corea (St. John, 51–54 fms.).

Murex pliciferus Sowb. Dkr., Index, p. 4, pl. 4, f. 1, 2.

Nagasaki (Lischke); Inland Sea (Stearns).

Murex haustellum Linn. Japan (Dkr.).

Murex (Chicoreus) sinensis Rve. Tokyo, Yedo, Nagasaki (Lischke); Tatiyama, Mososeki (A. Ad.).

Murex (Chicoreus) penchinati Crosse. J. de C., IX, p. 351, pl. 16, f. 6.

Nagasaki.

Murex ramosus Linn. Kamakura (Stearns).

Murex (Chicoreus) adustus Lamk. Ann., Mag., 1875, p. 419.

Ooshima; Tatiyama; Tsu-shima (Ad.).

Murex (Homalocantha) rota Sowb. Dkr., Index, p. 5, pl. 2, f. 3.

Japan (Dkr.).

Murex (Phyllonotus?) acanthophorus A. Ad. Ann. Mag., 1875, p. 420.

Hakodate, 5 fath. (St. John); Tsu-Saki (Ad.).

Murex (Phyllonotus) coronatus A. Ad. Thes. Conch., IV, pl. 400, f. 199.

Cape St. John, Tsu-Saki (Ad.).

Murex (Phyllonotus) unifasciatus A. Ad. P. Z. S., 1862, p. 372; Index, p. 7.

Uraga (Ad.).

Murex (Pteronotus) pinnatus Wood. Japan (Dkr.); China.

Murex (Pteronotus) brachypteron A. Ad. P. Z. S., 1862, p. 371.

Uraga (Ad.).

Murex (Pteronotus) gouldii A. Ad. Ibid, p. 371.

Tsu-Shima (Ad.).

Murex (Pteronotus) stimpsoni A. Ad. Thes., Vol. 4, pl. 400, f. 196.

Uraga (Ad.).

Murex (Muricidea) cirrosa Hinds. Voy. Sulphur, p. 9, pl. 3, f. 17, 18; C. Icon., f. 138; P. Z. S., 1879, p. 200.

E. of Goto Is., 58 fms. (St. John).

Murex (Muricidea) diadema A. Adams. Satanomosaki (Ad.).

Murex (Muricidea) puteolus A. Adams. Tsusaki (Ad.).

Murex (Phyllonotus) cuspidatus Sby. Thes., IV, pl. 400, f. 203.

Japan (Sowb.).

Murex (Pteronotus) speciosus A. Ad. Thes., Vol. 4, pl. 392, f. 125.

Yokohama (Sowb.).

Ocinebra inermis Sby. Thes., Vol. 4, pl. 402, f. 235. Japan.

Ocinebra contracta Reeve. C. Icon., f. 53 (*Buccinum*)+*B. funiculatum* Rve., *l. c.*, f. 61.

Japan (Stearns). Are *O. calcarea* and *innotabilis* really distinct from the half grown of this species? When adult it resembles *O. poulsoni* somewhat.

Ocinebra calcarea Dkr. Moll. Jap., pl. 1, f. 2. (Syn. Urosalpinx innotabilis Smith, P. Z. S., 1879, p. 201, pl. 20, f. 32).

N. of Kiushiu, 30 fms. (St. John).

Ocinebra fimbriatula A. Ad. P. Z. S., 1879, p. 201, pl. 20, f. 31. (*Trophon fimbriatulum* Ad.).

E. of Goto Is., 40 fms. (St. John).

Ocinebra japonica Dkr. Moll. Jap., p. 4, pl. 1, f. 14; Index, p. 8. (Syn.: *M. talienwhanensis* Crosse, J. de C., X, p. 56, pl. 1, f. 9).

Deshima (Nuhn); Nagasaki (Lischke).

Ocinebra falcata Sby. Thes., Vol. 4, pl. 394, f. 149.

Off Goto Is. (St. John); Kiushiu (Lischke).

Ocinebra falcata var. **adunca** Sowb. Rve., Conch. Icon., f. 61a.

East coast, between Tokyo and Ooshima (Stearns).

Some specimens are cream white with a subperipheral purple-brown zone; some are uniform dark purple-brown. The largest measures 66 mm. alt. Operculum purpuroid, the apex somewhat below the middle of the outer margin.

Ocinebra (Cerostoma) eurypteron Reeve. Voy. Samarang, pl. 8, f. 1.

Nagasaki (Lischke).

Ocinebra (Cerostoma) emarginata Sowb. C. Icon., III, f. 1.

Off Goto Is. (St. John); Boshiu (Stearns).

Ocinebra (Cerostoma) foliata Martyn. Univ. Conch., pl. 66. Dkr., Index, p. 7, pl. 4, f. 10, 11.

Northern Japan (Dkr.).

Ocinebra (Cerostoma) plorator Adams & Reeve. Zool. Samarang, p. 38, pl. 8, f. 3.

East coast, between Tokyo and Ooshima (Stearns).

A single specimen larger than the type, but apparently this species.

Operculum similar to that of *Ocinebra adunca*.

Ocinebra (Cerostoma) roriflua Adams & Rve. Zool. Samarang, p. 38, pl. 8, f. 2; P. Z. S., 1879, p. 200. (Syn.: *Murex monachus* Crosse, J. de C., 1862, p. 55, pl. 1, f. 8).

Tsaulian (A. Ad.); Nagasaki (Lischke); Goto Is, (St. John).

Ocinebra (Cerostoma) fournieri Crosse. J. de Conch., IX, p. 352, pl. 16, f. 7.

Nagasaki (Lischke).

Ocinebra (Cerostoma) burnettii Ad. et Rve. Ann. Mag. 1875, p. 420; Voy. Samarang. p. 38, pl. VIII, f. 4, a, b.

Endermo Harb., 4–7 fath., sandy mud.

Ocinebra (Cerostoma) endermonis E. A. Smith. Ann. Mag., 1875, p. 420, Thes., IV, pl. 401, f. 213.

Endermo Harb., 47 fath., sandy mud (St. John).

Ocinebra (Cerostoma) burnetti Ad. & Rve. Thes., IV, pl. 392, f. 128.

Japan.

Urosalpinx (?) birileffi Lischke. J. M. C., II, p. 32.

Island of Oki, Boshiu (Stearns); Nagasaki (Lischke).

Rapana bezoar Linné. Kiener, Coq. Viv., f. 42. (Purpura).

Yokohama Bay, Tokyo Harbor (Stearns); Yedo, Nagasaki (Lischke); Deshima (Nuhn); Hakodate, Simoda (A. Ad.).

Rapana bezoar var. **thomasiana** Crosse. Crosse, Journ. de Conchyl., 1861, p. 268, pl. 9, 10. (*R. thomasiana*).

Markets of Yokohama and Tokyo, a food mollusk (Stearns).

Rapana bulbosa Solander. Tryon, Man. Vol. II, p. 203, pl. lxiii, f. 336.

Japan (Dkr.); Yokohama Bay (Stearns).

Rapana (Latiaxis) mawæ Gray. Japan (Dkr.).

Rapana (Latiaxis) deburghiæ Reeve. Dkr., Index, pl. 1, f. 5–7.

Japan (Dkr.).

Rapana (Latiaxis) lischkeana Dkr. Index, p. 43, pl. 1, f. 1, 2; pl. 13, f. 26, 27.

Japan (Dkr.).

Rapana (Latiaxis) japonica Dkr. Index, p. 43, pl. 13, f. 24, 25.

Inland Sea of Japan (Dkr.).

Rapana (Latiaxis) sallei Jouss. Bull. Soc. Zool. France, 1883, p. 187, pl. 10, f. 3.

Japan Coast.

Purpura rudolphi Chemn. C. Icon., f. 10.

Japan (Dkr.).

Purpura persica Linn. Japan (Stearns).

Purpura luteostoma (Chemn.) Dillw. Chemn., Conchyl. Cab., XI, p. 83, pl. 187, f. 1800, 1801 (Good).

Seta coast and Saruga coast (Stearns); Hakodate, Yedo (Lischke); Deshima (Dkr.).

Purpura bronni Dkr. (Moll. Jap., pl. 1, f. 23) is a rather short specimen, not completely mature. See also Lischke, J. M. C., I, pl. 5, f. 17, and II, pl. 4, f. 20. (Nagasaki, Tatiyama, Deshima).

Purpura echinata Blainv. C. Icon., sp. 33.

Deshima (Nuhn); Nagasaki (Lischke).

Purpura heyseana Dkr. Index, p. 40, pl. 13, f. 10, 11.

Sea of Japan (Dkr.).

Purpura alveolata Reeve. (+*P. clavigera* Küst., *tumulosa* Lischke). Lischke, J. M. C., I, p. 54, pl. 5, f. 12–16; Vol. II, p. 39.

Kamakura, I. of Oki, Boshiu, Seta coast (Stearns); Ooshima (Challenger; St. John); Nagasaki (Lischke); Deshima (Dkr.).

Another synonym is *P. problematica* Baker (Proc. Rochester Acad. Sciences I, 1891, p. 135, pl. 11, f. 2, 3). So involved and difficult is the literature of this group of *Purpura* that we do not venture to say what the ultimate specific designation of the Japanese forms will be. There can be little doubt that all of Lischke's figures

cited above belong to one species. The numerous specimens collected by Mr. Stearns show both of Lischkes' forms and many intermediate between them, as well as other mutations. When completely adult there are a few widely spaced denticles within the lip, as in *P. luteostoma*, from which this form differs mainly in the blackish substance of the shell, which is conspicuously shown upon the eroded tubercles and within the aperture. Connecting specimens between this form and *luteostoma* probably occur.

Purpura lapillus Lin. Ann. Mag., 1875, p. 424.

Hakodate (Stearns).

Jopas sertum Brug. Japan (Dkr.; Stearns).

Ricinula ricinus Linné. Hachijoshima (Dkr.); Nagasaki (Lischke).

Ricinula morus Lam. Japan (Stearns).

Sistrum undatum Chemn. (*R. fiscellum* Reeve). Nagasaki (Lischke); Deshima (Nuhn).

Sistrum tuberculatum Blainv. Ann. Mag., 1875, p. 424.

Shores of Toba and Oshima (St. John).

Sistrum musiva Kiener. Icon. Coq. Viv. *Purpura*, pl. 9, f. 22.

Japan (Dkr.).

Sistrum asperum Lam. C. Icon., sp. 13 (*Ricinula*).

Japan (Dkr.).

Sistrum sidereum Reeve. C. Icon., sp. 14 (*Ricinula*).

Takano-Shima (Ad.).

CORALLIOPHILIDÆ.

Coralliophila monodonta Q. & G. Astrol., pl. 37, f. 9–11.

Hakodate Bay (Schrenck).

Coralliophila costularis Blainv. C. Icon., f. 63 (*Purpura*).

Japan (Dkr.).

Coralliophila jeffreysi Smith. P. Z. S., 1879, p. 213, pl. 20, f. 48.

Inland Sea, between Shikoku and Nippon, 22 fms. (St. John).

Coralliophila stearnsii n. sp. Pl. II, fig. 12.

Shell pure white, resembling in form *C. inflata* Dkr. Whorls 6, convex, sculptured with longitudinal folds, 11 on penult. whorl, and strong spiral cords passing over but lower on the folds, alternating in size, densely scaly, deeply separated, 7 or 8 on penult. whorl.

Aperture ovate, smooth within; umbilicus small. Alt. 18, diam. 12 mm.

Japan (Stearns).

Leptoconchus peronii Lam. (*Striatus* Rüpp.). Kino-o-Shima (Ad.).

Leptoconchus schrenckii Lischke. J. M. C., II, p. 45, pl. 4, f. 9, 10.

Nagasaki (Lischke).

Leptoconchus rostratus A. Ad. Dkr., Index, p. 45, pl. 6, f. 20, 21.

Kino-o-Shima, on Madrepores (Ad.); Bay of Yedo (Lischke).

Bulbus rapa Linné. (*Rapa papyracea* Lam., of authors). Japan (Dkr.).

(*Tœnioglossa*).

TRITONIDÆ.

Tritonium tritonis L. Ohosaka (Lischke).

Tritonium nodiferum Lamarck.

See next species, with which this is united by Tryon, Dunker and others.

Tritonium sauliæ Reeve. Lischke, J. M. C., I, p. 45; II, p. 33, pl. 1, 2.

Inland Sea, Sagami (Stearns); Yedo, Nagasaki (Lischke); Tatiyama, Tsu-Saki, Takano-Shima, Bay of Yedo (A. Ad.).

Tritonium (Simpulum) costatus (Born). Challenger Gastrop, 1873–6, XV, p. 390 (Sidney). Syn. *T.* (*Simpulum*) *olearium* Auct. Tryon, Man. Vol. III, p. 11, pl. III, f. 19.

Yedo, Nagasaki (Lischke); Tatiyama (A. Ad.); all along the coast from Tokyo to Ojima (Stearns).

Tritonium pileare L. C. Icon., f. 23.

Japan (Stearns; Dkr.).

Tritonium aquatile Reeve. C. Icon., f. 24.

Nagasaki (Lischke).

Tritonium clandestinum (Chemn.) Lam. C. Icon., f. 13.

Japan (Dkr.).

Tritonium labiosum Wood. C. Icon., f. 52.

Uraga (A. Ad.).

Tritonium dorsuosum A. Adams. Ibid, 420.

Tatiyama (Adams).

Tritonium lotorium Linné. Japan (Dkr.).

Tritonium dunkeri Lischke. Lischke, J. M. C., I, p. 49, pl. 3, f. 1, 2.

Japan (Stearns); Nagasaki (Lischke).

Tritonium moritinctum Reeve. C. Icon., f. 49.

Tatiyama (A. Ad.).

Tritonium vespaceus Lam. Japan (Stearns).

Tritonium tenuiliratum Lischke. J. M. C., III, p. 30, pl. 2, f. 18, 19.

South coast of Japan (Lischke).

Tritonium excavatum Reeve. Lischke, J. M. C., III, pl. 2, f. 15–17.

Japan, Tokyo (Stearns); Yedo and Nagasaki (Lischke).

Tritonium lobbeckei Lischke. J. M. C., II, p. 36, pl. 4, f. 13, 14.

Nagasaki (Lischke).

Tritonium reticosum A. Adams. Ann. Mag. N. H., 1870, p. 420.

Japan (Cuming; Adams).

Tritonium lirostoma A. Adams. Ann. Mag. N. H. (4), v, p. 419.

Simidzu (Adams).

Tritonium papillosum A. Adams. Ibid, p. 419.

Takano-Shima (Adams).

Tritonium nodiliratum A. Adams. Ibid, p. 419.

Japan (Cuming coll.).

Tritonium tringa A. Adams. Ibid, p. 420.

Uraga (Adams).

Distortrix reticulata Link. C. Icon., f. 41, 45, 46, 102.

Japan (Dkr., as *Tritonium decipiens* Rve. and *reticulare* Linn.).

Priene oregonensis Redfield. Ann. Lyc. N. H., New York, 1846, IV, p. 165, pl. VI, f. 2.

Bay of Yedo (Lischke); Hakodate (Stimp.); Okosiri and Aniwa Bay (A. Ad.).

Gyrineum rana (Linné). (*R. albivaricosa* Rve.). Tryon, Man. Vol. III, p. 38, pl. 18, f. 5, 6.

Nagasaki (Lischke); Kii coast (Stearns).

Gyrineum subgranosum Beck. Seto-Uchi (Ad.).

Gyrineum bufo Chemn. Ind. Moll. Mor. Jap., p. 31, pl, 5, f. 3, 4 (var.).

Kiusiu (Dkr.).

Gyrineum lampas Linné. C. Icon., II, pl. 10, f. 30b.

Nagasaki (Lischke); Kii coast (Stearns).

Gyrineum graniferum Lam. Japan (Dkr.).

Gyrineum affine Brod. Rve., Conch. Icon., *Ranella*, f. 19.

Japan (Stearns).

Gyrineum cruentatum Sowb. Japan (Stearns).

Gyrineum ranelloides Rve. C. Icon., f. 10.

Kiusiu (Lischke). Tryon considers this a synonym of *cruentata*.

Gyrineum tuberculatum Brod. Japan (Dkr.).

Gyrineum lamellosum Dkr. Japan (Dkr.).

Gyrineum (Biplex) perca Perry (*pulchra* Gray).

Inland Sea (Stearns; 33 specimens); Kiusiu (Lischke).

CASSIDIDÆ.

Cassis cornuta Linné. Nagasaki (Lischke).

Cassis rufa Linné. C. Icon., pl. 8, f. 20a.

Nagasaki (Lischke).

Cassis pila Reeve. Rv., Conch. Icon., V, f. 21.

Japan (Stearns); Nagasaki (Lischke).

Cassis japonica Reeve. Rv., Conch. Icon., f. 23 *a*, *b*.

Japan (Stearns); Nagasaki (Lischke); Tatiyama, Tsusaki (A. Ad.).

This form differs from *C. pila* in having the upper surface and spire densely granulated. It is typically without varices. Some specimens lack the rows of brown blotches.

Cassis coronulata Sowb. C. Icon., f. 31.

Nagasaki (Lischke); Ooshima, Kii (Stearns).

Cassis strigata Gmel. Rve., Conch. Icon., V, f. 26.

Sagami Coast (Stearns, 25 specimens); Bay of Yedo (Lischke); Mososeki, Seto-Uchi (A. Ad.).

The specimens agree exactly with Reeves' beautiful figure, except that the inner lip exhibits some short callous wrinkles above.

Cassis strigata Gmel. var. Japan (Stearns).

Several shells before me differ from the type in being smaller, and having spiral grooves over the entire body-whorl. One of them lacks varices; two others have each a single varix near the beginning of the body-whorl.

Cassis vibex Linné. Japan (Dkr.); east coast (Stearns).

Cassis pirum Lam. C. Icon., f. 29 (*zeylanica* Lam.).

Japan (Dkr.).

Cassis achatina var. **inornata** Pils. Pl. II, fig. 17.

Japan (Stearns).

Shell oblong with conical spire, the body-whorl smooth, shouldered above, the shoulder weakly nodulous; suture broadly margined. Whorls of spire angulated and nodulous, spirally striated above the angle, the upper ones decussated by fine radial folds. Nucleus nacoid, consisting of 3½ smooth, white, rounded whorls. Outer lip reflexed and spotted, having obscure traces of teeth below; columella smooth; base of body-whorl smooth. Alt. 65, diam. 40 mm.; alt. of aperture 46 mm.

Oniscia macandrewi G. B. Sowerby, Jr. Pl. II, fig. 3.
P. Z. S., 1888, p. 567, pl. 28, f. 1, 2.

Japan (Hungerford, Stearns).

Shell similar to *O. cancellata*, but broader above, ponderous, the spiral cords not in the least prickly where they cross the longitudinal ribs; the latter being stout and rounded, nearly as wide as the interspaces. Buff-white, maculated and obscurely two-banded with brown, speckled with the same, especially on the ribs and lip-varix. Aperture and columella as in *cancellata*, but sometimes lacking rugosities between the lip-teeth.

Alt. 45, diam. 29 mm.; alt. of aperture 36 mm.

Alt. 36, diam. 24 mm.; alt. of aperture 30 mm.

DOLIIDÆ.

Dolium fasciatum Martini. C. Icon., sp. 11.

Nagasaki (Lischke).

Dolium zonatum Green. Tr. Alb. Inst., I, p. 131 (*D. crenulatum* Phil.).

Nagasaki (Lischke); S. of Tokyo Bay (Stearns).

Dolium lischkeanum Küster. C. Cab. p. 71, pl. 62, f. 1.

Nagasaki (Lischke).

Dolium tessellatum Lam. Japan Sea (Dkr., Index, p. 57.)

Dolium chinense Dillw. Japan (Dkr.).

Dolium luteostoma Küst. Dkr., Nov. Conch., p. 104, pl. 35, 36 ("*D. japonicum*"); Index, p. 58.

East coast south of Tokyo (Stearns, young shells only); Yedo, Nagasaki (Lischke); Hakodate (Schrenck).

Dolium perdix Linn. Japan (Stearns).

Dolium pomum Linné. Japan (Dkr.).

Pyrula reticulata Lam. Tokyo (Dkr.); Nagasaki (Lischke); Kuro-Shima (A. Ad.); Matsu-yeno-hama Coast (Stearns).

CYPRÆIDÆ.

The claims of some of the following species to a place in the Japanese fauna are of doubtful validity.

Cypræa scurra Linn. Roberts, Man. Conch., VII, pl. 2, f. 19–21.
Japan (Stearns, No. 1087).

Cypræa testudinaria Linné. Man. Conch., VII, pl. 1, f. 9, 10.
Nagasaki (Lischke).

Cypræa isabella Linné. Man. Conch., VII, p. 165, pl. 1, f. 6, 7.
Nagasaki (Lischke, Stearns).

Cypræa carneola Linné. Japan (Dkr.).

Cypræa fimbriata Gmelin. Man. Conch. VII, p. 166, pl. 5, f. 76–78.
Japan (Reeve); Deshima (Nuhn); Kino-o-Shima (Ad.); Nagasaki (Lischke).

Cypræa macula Ad. Roberts in Tryon, Man. Conch., VII, p. 169, pl. 4, f. 71, 72.
Japan (A. Ad.; Stearns); N. coast of Tango (Gaines, in Stearns coll.).

Cypræa felina Gmelin. Man. Conch., VII, p. 169, pl. 4, f. 52–55, 59, 60.
Nagasaki; Kino-o-Shima (Lischke).

Cypræa neglecta Sowerby. Man. Conch., VII, p. 170, pl. 4, f. 61, 62, 63.
Japan (Sowerby).

Cypræa cylindrica Born. Conch. Cab. p. 12, 32, pl. III. f. 6, 7; pl. IX, f. 5–7.
Japan (Weinkauff).

Cypræa hungerfordi Sowerby. P. Z. S., 1888, p. 208, pl. 11, f. 1–3.
Japan? (Sowb.).

Cypræa caurica Linné. Man. Conch., III, p. 171, pl. 5, f. 88–90.
Japan (Lischke); Satanomosaki (Ad.).

Cypræa mauritiana Linn. Man. Conch., VII, p. 173, pl. 7, f. 8–11.
Bay of Yedo (Lischke, Stearns); Hakodate (Schrenck).

Cypræa caputserpentis Linné. Man. Conch., VII, p. 173, pl. 6, f. 98–100.
Japan (McAndrew; Stearns, "very rare"); Nagasaki (Lischke); Tanabe, Kino-o-Shima, Tago and Tsu-Shima (A. Ad.).

Cypræa arabica Linné. Man. Conch., VII, p. 174, pl. 8, f. 18, 19.
Yedo (Lischke, Stearns); Tago (Ad.).

Cypræa reticulata Martyn. Man. Conch., VII, p. 174, pl. 8, f. 21. 22.
Japan (Lischke, Stearns); Kino-o-Shima (Ad.).

Cypræa moneta L. Roberts in Tryon, Man. Conch., VII, pl. 23, f. 60, 61.

Japan, not common (Stearns).

Part of the specimens are white beneath, part yellow.

Nagasaki (Lischke) Tatiyama and Tanabe (Ad.); Hakodate (Schrenck).

Cypræa annulus L. Roberts, Man. Conch., VII, p. 178, pl. 11, f. 57–61.

Nagasaki, Japan (Lischke, Stearns).

Cypræa tigris Linné. Man. Conch., VII, p. 180, pl. 11, f. 49.

Yedo (Lischke); Satsuma (Stearns), rare.

Cypræa vitellus Linné. Japan (Dunker, Lischke, Stearns); Kino-o-Shima (A. Ad.).

Cypræa onyx Linné. Man. Conch., VII, p. 183, pl. 13, f. 77–81.

Japan (Stearns); Tsu-Saki, Tatiyama, Tanabe (A. Ad.); Nagasaki (Lischke).

Cypræa lynx Linné. Man. Conch., VII, p. 183, pl. 14, f. 86, 87.

Japan, quite rare (Stearns); Yedo (Lischke).

Cypræa errones Linné. Roberts, Man. Conch., VII, p. 183, pl. 14, f. 88, 89.

Southern Japan (Lischke).

Cypræa pallida Gray. Conchyl. Cab., p. 60, pl. 18, f. 5, 8, 11.

Japan (Lischke, Stearns).

Cypræa asellus Linn. Man. Conch., VII, p. 187, pl. 16, f. 34,.

Japan (Stearns).

Cypræa clandestina Linné. Man. Conch., VII, p. 187, pl. 16, f. 37, 38.

Tsu-Sima; Tatiyama; Kino-o-Shima (Ad.).

Cypræa cribraria Linné. Japan (Dkr.).

Cypræa punctata Linné. Conchyl. Cab., p. 98, pl. 30, f. 6, 9.

Japan (Lischke).

Cypræa lamarcki Gray. Man. Conch., VII, p. 192, pl. 18, f. 96, 97.

Japan (Sowerby).

Cypræa miliaris Gmelin. Bay of Yedo (Lischke).

Cypræa erosa Linné. Man. Conch., VII, p. 192, pl. 18, f. 90, 100, 1.

Yokohama (Stearns); Tanabe and Takano-Shima (A. Ad.)

Cypræa poraria Linné. Man. Conch., VII, p. 193, pl. 18, f. 2, 3.

Japan (Stearns).

Cypræa helvola Linné. Man. Conch., VII, p. 194, pl. 19, f. 8, 9.

Japan (Lischke, Stearns).

Cypræa (Pustularia) staphylæa Linné. Man. Conch., VII, p. 196, pl. 20, f. 39–41.
Japan (Stearns); Satanomosaki, Tatiyama, Takano-Shima (A. Ad.).

Cypræa (Pustularia) nucleus Linn. Man. Conch., VII, p. 197, pl. 20, f. 48, 49.
Japan (Stearns).

Cypræa (Epona) globulus Linn. Yokohama (Stearns); Satanomosaki (Ad.); Dunker reports *C. cicercula*, also.

Trivia oryza Lamarck. Man. Conch., VII, p. 200, pl. 21, f. 82, 83.
Japan (Lischke).

Trivia grando Gaskoin. Roberts, Man. Conch., VII, p. 200, pl. 21, f. 86, 87.
Goto; Simoda (A. Ad.).

Erato callosa Adams & Reeve. Zool. Samarang, p. 25, pl. 10, f. 32.
Tokyo Bay, Nagasaki (Lischke); Deshima (Nuhn).

Erato lachryma Gray. Thes., III, p. 82, pl. 219, f. 4–6.
Kamakura, Tokyo Harbor, etc. (Stearns).

OVULIDÆ.

Ovula ovum Linné. Man. Conch., VII, p. 246, pl. 1, f. 11, 12.
Japan (Dkr.).

Ovula rhodia Ad. Conchyl. Cab., p. 180, pl. 46, f. 14, 15.
Nemoto, Boshiu (Stearns); Tokyo Bay (Lischke).

Ovula triticea Lam. Thes. Conch., II, p. 474, pl. 101, f. 99, 100.
Japan (Dkr.). A doubtful species.

Ovula lactea Lamarck. Man. Conch., VII, p. 247, pl. 2, f. 23–25.
Kino-o-Shima (Adams).

Ovula pyriformis Sowerby. Man. Conch., VII, p. 247, pl. 2, f. 43–45.
Satanomosaki (A. Adams).

Ovula bulla Ad. & Rve. Zool. Samarang, p. 21, pl. 6, f. 5.
Satanomosaki, 55 fms. (A. Adams).
Tryon unites this and the next to *O. margarita* Sowb.

Ovula umbilicata Sowerby. Conchyl. Cab., p. 178, pl. 46; f. 9–12.
Goto Is., 71 fms. (Adams).

Ovula concinna Adams & Reeve. Zool. Samarang, p. 22, pl. 6, f. 8.
Mino-Shima (Adams).

Ovula punctata Duclos. Conchyl. Cab. p. 182, pl. 47, f. 6, 7.
Goto Is., 48 fms. (Adams).

Ovula bullata Ad. & Rve. Zool. Samarang, p. 23, pl. 6, f. 12.

Japan, Goto Is. (Adams).

Ovula scitula A. Adams. Conchyl. Cab., p. 185, pl. 47, f. 14, 15.

Tsu-Shima (A. Ad.). Tryon unites this to *O. bullata.*

Ovula striatula Sowerby. Conchyl. Cab., p. 186, pl. 48, f. 2, 3.

Tsu-Saki, 55 fms. (A. Ad.).

Ovula dentata Ad. & Rve. Zool. Samarang, p. 21, pl. 6, f. 4,

Goto Is., 4 fms. (Adams).

Ovula dorsuosa Hinds. Conch. Cab., p. 187, pl. 48, f. 6, 7.

Goto Is., 48 fms. (Adams).

Ovula obtusa Sowerby. Man. Conch., VII, p. 251, pl. 3, f. 87, 88.

Mino-Shima, 63 fms.; Kuro-Shima, 39 fms. (A. Ad.).

Ovula formosa Ad. & Rve. Zool. Samarang, pl. 6, f. 6 *a*, *b*.

Kino-o-Shima (A. Adams).

Cyphoma elongata A. Ad. Journ. Linn. Soc., VII, p. 96.

Goto, 48 fms. (A. Ad.).

Volvula volva Linn. Man. Conch., VII, p. 252, pl. 4, f. 94, 95.

Ojima (Stearns); Kiusiu (Lischke); Satanomosaki, 55 fms. (Ad.).

Volvula recurva Ads. & Rve. Zool. Samarang, p. 21, pl. 6, f. 3.

Satanomosaki, 55 fms. (Ad.).

Volvula philippinarum Sowerby. Thes. Conch., II, p. 481, pl. 100, f. 57, 58.

Japan (Dkr.). Tryon makes *subreflexa* Sowb., reported by Adams from Tsu-Shima, a synonym, and also *carpenteri* Dkr.

Volvula carpenteri Dunker. Index, p. 102, pl. 13, f. 1, 2.

Volvula adamsii Dunker. Index, p. 102, pl. 13, f. 3, 4.

Volvula birostris Lamarck. Man. Conch., VII, p. 253, pl. 4, f. 10, 11.

Japan (Sowerby).

Volvula (Neosimnia) acuminata Ads. & Rve. Zool. Samarang, p. 21, pl. 6, f. 1.

Kuro-Shima, 35 fms. (Ad.).

STROMBIDÆ.

Strombus latissimus Linné. Ohosaka (Lischke).

Strombus lentiginosus Linn. Japan (Stearns).

Strombus aurisdianæ var. **laevis** Perry.

S. aurisdianæ (part) Linné, Dillwyn and of Sowerby, Thes., I.
S. laevis Perry, Conchology, pl. 13, f. 4 (1811).

S. "*guttatus* Martini," of authors (=Pugil flavescens, albo, *guttatus, lævis* Martini, Conch. Cab., II, p. 87, f. 840).

Japan (Dkr.).

As Linnæus included both the rough and smooth forms in his citations and cabinet under the name *auris-dianae*, it is evident that the present form must bear the name given by Perry, who first of binomial authors distinguished it. The well-known rough form with smooth mouth retaining Linnæus' term, of which *S. striatogranosus* Mörch is a synonym. If the striation of the posterior sinus of the aperture proves racially constant, this form (C. Icon., f. 36 *b*; Thes., f. 98, 99) may be called var. *lamarckii* Gray. The other variety, *melanostomus* Swains., is generally recognized (C. Icon., f. 37).

Strombus aratrum Martyn.

Alata aratrum Martyn, Univ. Conch., pl. 1 (1789).

Strombus auris Dianae Zelandiae Novae, etc., Chemn., C. Cab., X, p. 210, pl, 156, f. 1485, 1486.

S. auris dianae var. Gmel., Dillw.

S. chemnitzii Pfr. Krit. Reg. zu Mart. u. Chem., pp. viii, 96 (1840).

Strombus acutus Perry, Conchol., pl. 12, f. 2 (1811).

Strombus pacificus Swains, Exot. Conch., pl. 17.

Strombus "*novæzelandiæ* Chemn.," Rve., C. Icon., f. 35.

Bay of Yedo (Lischke).

The above names are absolute synonyms of *S. aratrum*. *S. australis* has been considered a variety of the above species by Tryon, but in the absence of intermediate forms may well be retained distinct, being distinguished by the characters recited below. It has not been reported from Japan.

S. australis Sowb., Thes., I, p. 36, pl. 9, f. 96, 97 (1847).

Coronal tubercles on body-whorl small and numerous, several strong median cords on body-whorl, and spiral sculpture much stronger throughout; columellar callus more colored; basal and upper wing processes black-tipped, and lip black-edged when fully adult; posterior sinus of aperture with two stronger cords.

Strombus succinctus L. var. **robustus** Sowb. Sowb., P. Z. S., 1874, p. 599. pl. 72, f. 5, 5a.

Hong-Kong (Cuthill; Sowb.); Japan (Stearns); Tatiyama, Oki-no-Shima (Ad.).

Strombus japonicus Reeve. Rv., Conch., con., f. 42; Lischke, J, M. C., I, pl. 5, f. 7.

Kishiu (Stearns, 70 specimens); Nagasaki (Lischke); Deshima (Nuhn); Takano-Shima and Tomo (A. Ad.).

The specimens are larger and darker colored than Reeve's figure, but agree well with Lischke's.

Strombus urceus Linné (*floridus* Lam.; *mutabilis* Swains). Japan (Dkr., as *flosculosus* Martini; Stearns); Kiusiu (Lischke).

Strombus ustulatus Schum. (*urceus* Auct. not Linn.) Japan (Dkr.; Stearns); Nagasaki (Lischke).

Strombus dentatus L. var. **corrugatus** Ads. & Rve. A. &. R., Voy. Samarang, Moll. pl. 10, f. 19.

Japan (Stearns).

Strombus gibberulus Linn. Japan (Stearns).

Strombus samar (Chemn.). Dillw. Tryon, Man. Conch., VII, p. 121, pl. 8, f. 88.

Japan (Stearns).

Strombus luhuanus Linné. Tokyo (Dkr.); Nagasaki (Lischke); Takano-Shima and Tago (A. Ad.).

Strombus isabella Lam. Southern Japan (Lischke).

Pterocera chiragra Linné. Man. Conch. VII, p. 126. Japan (Dkr.).

Pterocera millepeda Linné. Japan (Dkr.).

Pterocera lambis Linné. Japan (Dkr.).

Pterocera bryonia Gmel. Nagasaki (Lischke); Hakodate (Schrenck).

Rostellaria powisii Petit. Man. Conch. VII, p. 128. Japan (Dkr.).

Seraphs terebellum Linné. (*Terebellum punctatum* and *subulatum* of authors).

Bay of Yedo (Lischke); Nagasaki and Yobuko (A. Ad.).

CERITHIIDÆ.

Cerithium echinatum Lam. Tryon, Man. Conch., IX, pl. 20, f. 25; Dkr., Index, p. 106.

Japan (Stearns; Dkr.).

Cerithium guinaicum Phil. Abbild. III, pl. 1, f. 13.

Japan (Dkr.).

Cerithium columna Sowb. Thes., pl. 178, f. 55–58.

Japan (Dkr.).

Cerithium dialeucum Phil. Abbild., III, pl. 1, f. 5.

Nagasaki (Lischke).

Cerithium kobelti Dunker. Index, p. 106, pl. 4, f. 8, 9.

Japan (Dunker); Tokyo Harbor (Stearns).

Cerithium humile Dkr. Moll. Jap., p. 9, pl. 2, f. 17; J. M. C., III, p. 50, pl. 3, f. 18, 19, 20.

Nagasaki (Lischke); Deshima (Nuhn).

Cerithium granosum Kiener. Coq. Viv., pl. 4, f. 3.

Nagasaki (Lischke).

Cerithium carbonarium Philippi. Challenger Gastrop, 1873–6, XV, p. 531; (Syn.: *C. bornii* Rve., Conch. Icon., XV, pl. V, f. 26).

Ooshima (Challenger).

Cerithium rugosum Wood var. E. A. Smith, Ann. Mag., 1875, Vol. XVI, p. 106.

Ooshima (St. John).

Cerithium (Colina) macrostoma Hinds. Hds., Voy. Sulphur, pl. 16, f. 12.

Banda, Boshiu (Stearns); Sts. of Macassar (Hds.); Dumaguete and other Philippine localities (Cuming, *et al.*).

A peculiar little species, showing great variation in the hundred or more specimens collected by Mr. Stearns. The extensive synonymy is given I believe correctly by Tryon, Man. Conch., IX, p. 142.

Clava sinensis Gmel. (*obeliscus* Brug.) Japan (Dkr., as *Vertagus chinensis* Chemn.).

Clava aluco Linné. Man. Conch. IX, p. 145. pl. 27, f. 38. Japan (Dkr.).

Clava fasciata Brug. Sowb., Thes., II, pl. 176, f. 6.

Japan (Stearns; 53 collected).

Clava attenuata Phil. Abbild., I, pl. 1, f. 2; Man. Conch. IX, p. 148.

Corea Straits (Ad.).

Clava kochi Philippi. Ann. Mag. N. H., 1875, XVI, p. 105; Abbild., III, pl. 1, f. 3.

Banda, Boshiu (Stearns); Nagasaki (Lischke); Tango Coast (Gaines); Matoza Harb., 6 fath. (St. John).

Clava turrita Sby. Ann. Mag., 1875, Vol. XVI, p. 106; Man. Conch. IX, p. 147.

Ooshima, 8 fath. (St. John).

Clava pfefferi Dunker. Index, p. 108, pl. 4, f. 12–14.

Japan (Dkr.). Tryon considers this a synonym of *C. turritum.*

Clava asper Linn. Japan (Stearns).

Clava vertagus Linn. Japan (Stearns).

Bittium pusillum Dkr. Moll. Jap., p. 11, pl. 2, f. 6.

Deshima (Dkr.).

Bittium scalatum Dkr. Index, p. 108.

Japan (Dkr.).

Bittium oosimense Watson. Challenger Gastrop. XV, p. 548, pl. XXXIX, f. 1.

Ooshima (Chall.). Must be somewhat like the preceding.

Potamides (Telescopium) telescopium Linné. Japan (Stearns, one poor specimen).

Potamides (Tympanotonos) fluviatilis P. & M. Nagasaki (Lischke); Japan (Stearns).

Potamides (Batillaria) zonalis Brug. Lischke., J. M. C., I, pl. 6, f. 15, 16.

Tokyo Harbor (Stearns); Ooshima (St. John); Nagasaki (Lischke); Yokohama (Martens).

The following forms are closely allied.

Potamides (Batillaria) cumingi Crosse. *Lampania cumingi* Crosse, J. de C., 1862, p. 54, pl. 1, f. 10, 11; J. M. C., I, pl. 6, f. 11–14.

Tokyo Harbor; Banda, Boshiu (Stearns); Hakodate (Schrenck)

Potamides (Batillaria) multiformis Lischke. J. M. C., I, pl. 6, f. 1–10.

Tokyo Harbor (Stearns).

The specimens correspond best with Lischke's figs. 7, 8, but are white-banded at suture.

Potamides (Batillaria) aterrima Dkr. Index, p. 109, pl. 5, f. 7, 8.

Japan (Dkr.). Hardly distinct from the preceding. In fact all the above forms of the *P. zonalis* group should probably be considered varieties of that species. Mr. R. B. Newton has shown that *Batillaria* Bens. should replace *Lampania* Gray as a subgeneric name for these forms.

CERITHIOPSIDÆ.

Cerithiopsis subreticulata Dkr. Moll. Jap., p. 9, pl. 2, f. 10.

Deshima (Dkr.).

Cerithiopsis rosea A. Ad. Ann. Mag. N. H. (3), VII, 1861, p. 130.

Tsu-Shima, 16 fms. (Ad.).

Cerithiopsis cerina, baculum, clavula A. Ad. *Ibid.*

Mino-Shima, 63 fms. (Ad.).

Cerithiopsis paxillus, pagodula A. Ad. *t. c.*, p. 131.

Corea Strait, 46 fms. (Ad.).

Seila dextroversa Ad. & Rve. Zool. Samarang, p. 45, pl. 11, f. 31.

Tsu-Shima, 16 fms.; Corea Strait, 46 fms. (Ad.).

Seila cingulata A. Ad. Ann. Mag., VII, 1861, p. 131.

Tsu-Shima, 16 fms. (Ad.).

TRIFORIDÆ.

Triforis fusca Dkr. Moll. Jap., pl. 2, f. 22.

Kamakura, Tatagama. Boshiu, Tokyo Harbor (Stearns); Nagasaki (Lischke); Deshima (Nuhn); N. coast of Tango (Gaines).

Triforis violacea Q. & G. Astrol., pl. 55, f. 22, 23; Man. Conch. IX, p. 182.

Deshima (Dkr.).

Triforis granulata A. & R. Zool. Samarang, pl. 11, f. 33a, b.

Triforis exilis Dkr. Moll. Jap., p. 10, pl. 2, f. 9.

Deshima (Dkr.).

Triforis conspersus (A. Ad.) E. A. Smith. Ann. Mag., 1875, Vol. XVI, p. 106.

Cape Shima, 18 fath., sand (St. John).

Triforis purpuratus n. sp.

Shell purple; cylindric-fusiform, the lower three whorls of nearly equal diameter, those above tapering to form a long cone somewhat over one-third the shell's length. Whorls 10, those of the spire bearing three equal spiral series of rounded beads and a small smooth thread immediately above the suture; last whorl with four bead-series, the lower one nearly smooth, and on the base two smooth ribs with clathrate intervals. Aperture as in *T. granulata* A. & R., but tube very short, not closed. Alt. 5·4, diam. 1·8 mm.

Kamakura (F. Stearns).

Triforis (Viriola) corrugatus Hinds. Ann. Mag., 1875, Vol. XVI, p. 106.

Cape Shima, 18 fathoms, sand (St. John).

Not so stout a shell as the next species, judging by Singapore specimens before me.

Triforis (Viriola) tricincta Dkr. (*cingulata* Dkr. not Ad.; *dunkeri* Jouss.) Moll. Jap., pl. 2, f. 1.

Kamakura, Tatagama, Boshiu, Tokyo Harbor (Stearns); N. shore of Tango (Gaines).

Dunker's figures of a young shell give but a poor idea of the adult of this fine species. The three names given above are all founded on the one original description of Dunker.

PLANAXIDÆ.

Planaxis pyramidalis Gmel. Nagasaki (Lischke, J. M. C., II, p. 70).

Planaxis sulcatus Born. Ann. Mag., 1875, Vol. XVI, p. 104; Man. Conch. IX, p. 276.

Shore at Ooshima (St. John).

Planaxis cingulatus Gld. Otia Conch., p. 140.

Ousima, under stones below water-mark (Stimpson).

TRICHOTROPIDÆ.

Trichotropis cedo-nulli A. Ad. Conch. Icon., Vol. 19, pl. 2, f. 7 a, b.

Mino-Shima, 63 fms.; Goto Is., 48 fms. (Adams).

Trichotropis bicarinata Broderip & Sby. Conch. Icon., XIX, pl. 1. f. 2.

Aniwa Bay, 17 fms. (Ad.).

Trichotropis borealis Brod. & Sowb. Thes., III, p. 321, pl. 285, f. 1–3.

Castle Point, Manchuria, 37 fms. (A. Ad.).

Trichotropis inermis Hinds. Thes., III, p. 321, pl. 285, f. 14.

Okosiri Island, 35 fms. (A. Ad.).

Trichotropis insignis Middendorff. Mal. Rossica, II, p. 107, pl. 10, f. 7–9; Ann. Mag. N, H., 1875, XVI, p. 103.

Akishi, 3 to 4 fath. (St. John); Aniwa Bay (Ad.).

Trichotropsis unicarinata Brod. & Sowb. Conch. Icon.. XIX, pl. 2, f. 8.

Yamada Harbor, 7 fms. (St. John).

Trichotropis quadricarinata A. Ad. Conch. Icon., pl. 2, f. 9 a, b.

Mino-Shima (A. Adams).

Separatista separatista Dillwyn (**S. chemnitzii** A. Ad.). Dkr., Index, pl. 2, f. 1, 2.

Nemoto, Bishiu (Stearns).

VERMETIDÆ.

Thylacodes imbricatus Dkr. Moll. Jap., p. 17, pl. 2, f. 18; J. M. C., I, p. 83.

Yedo, Nagasaki (Lischke): Deshima (Nuhn); Manchurian and and Japanese coasts (A. Ad.). Lives on stones.

Thylacodes nodosorugosus Lischke. J. M. C., I, p. 84, pl. 5, f. 1-4.

Ohosaka, on *Tridacna squamosa* (Lischke).

Thylacodes medusæ Pilsbry. Plates IV, and V.
Proc. A. N. S., Phila., 1891, p. 471, pl. 17, 18.

Saruga coast, on shells (Stearns).

A large species, nearly always living in clusters, attached generally to shells. The young form an irregular spiral, the whorls of which rest prone upon the base of attachment. As the tube increases in diameter it becomes carinated on the lower outer portion, or the part corresponding to the "shoulder" of the whorl in a regularly spiral gasteropod. At this stage the whorls become more laxly coiled, and when not too closely clustered, present the appearance of

such planorboid forms as *T. masier* Dh., *T. atra* Rouss, etc. This stage is shown in the cluster pictured on pl. IV. The subsequent growth is erect and but slightly spiral, the tube generally contracting slightly in diameter, and cylindrical in form. The sculpture consists of narrow longitudinal cords at rather wide intervals, the spaces being occupied by a variable number of threads, (usually three) of which the middle one is larger. Irregular growth-lines crenulate the longitudinals. This sculpture is normally developed upon all sides of the tube. Upon the latter part of the free portion it is often subobsolete. The aperture is circular in adult shells, at right angles to the tube, and white within. The external surface is of a pale brown tint. No internal septa were found in numerous broken specimens; and although the shells were apparently alive when collected, no opercula were preserved in them, the absence of this organ being one of the characteristics of *Thylacodes*.

The dimensions may be seen in the figures, which are of natural size. The diameter of the tubes at the aperture averages 13 mm.

The embryonic shell, at the time it becomes attached, is bulimiform, glossy and smooth; lying upon its side. The first whorl formed after attachment takes place is perfectly planorboid, showing the nuclear shell in the center.

This species differs from *Vermetus imbricatus* Dkr. in lacking the imbricating growth-striæ of that form. As figured by Dunker *V. imbricatus* is a planorboid form, like *V. masier* Dh., *atra* Rouss, etc., but it may possibly be an immature shell.

T. medusæ is apparently allied to *V. polyphragmus* Sassi, *V. dentiferus* Lam. and *V. novæ-hollandiæ* Rouss, but it differs from them in having the sculpture developed over the whole circumference of the tube, not confined to its upper surface, or the part corresponding to the base of the shell in ordinary gasteropods, as it is in those species.

Spiroglyphus planorbis Dkr. Moll. Jap., p. 18, pl. 2, f. 16

Deshima, on *T. imbricatus*. (Dkr.).

Siliquaria (Pyxipoma) lactea Linné. Man. Conch., VIII, p. 191, pl. 58, f. 26.

Japan (Dkr.).

Siliquaria (Agathirses) cumingii Morch. Man. Conch., VIII, p. 190, pl. 57, f. 19; pl. 58, f. 21.

Nemoto, Boshiu (Stearns); Bay of Yedo (Lischke).

Siliquaria (Agathirses) australis Quoy. Man. Conch., VIII, p. 189.

Nemoto, Boshiu; Tokyo Harbor (Stearns). Many small specimens.

Vermetus tokyoensis n. sp. Pl. I, figs. 9, 10, 11.

Shell small, solitary, composed of numerous very slowly enlarging whorls, oval or round in section, entirely prone, forming an irregular recumbent spiral, or an amorphous combination of spirals, all in contact, or the last free at the aperture; nearly smooth, but showing in some places irregular concentric costulæ or wrinkles; diameter of whorl at aperture 1½ mm. Earlier whorls showing two strong, rather sharp parietal laminæ, and a very slight columellar cord; the section being rather dumb-bell shaped (fig. 10).

Tokyo Harbor (Stearns).

TURRITELLIDÆ.

Turritella erosa Couthouy. Bost. Journ. N. H., II, 1839, p. 103, pl. 3, f. 1.

Northern Japan (Schrenck).

Turritella fascialis Mke. Ann. Mag., 1875, XVI, p. 107.

Goza Harb., 6 fath., sandy mud (St. John).

Turritella gracillima Gld. Otia Conch., p. 140.

Kagoshima Bay (Stimpson).

Turritella bacillum Kiener. Japan (Stearns, one dead shell).

Turritella cerea Reeve. C. Icon., pl. 6, f. 25.

Nagasaki (Lischke).

LITTORINIDÆ.

Littorina grandis Middendorff. Midd., Reise, p. 198, pl. 11, f. 4–10.

Bay of Castries.

Littorina brevicula Philippi. Conchyl. Cab., p. 100, pl. 14, f. 10, 11.

Nagasaki and Hakodate (Lischke); Endermo (St. John).

Littorina mandschurica Schrenck. Reisen im Amurl., II, p. 333, pl. 14–20; *L. souverbiana* Crosse, J. de C., X, p. 53, pl. 1, f. 6, 7, and *L. balteata* Reeve, Icon., X, f. 71, a, b, are identical.

Northern Japan.

Littorina malaccana Phil. Abbild., III, p. 51, pl. 6, f. 17.

Tokyo (Dkr.).

Littorina exigua Dunker. Moll. Jap., p. 13, pl. 2, f. 13; Conchyl. Cab., p. 95, pl. 13, f. 13–16.

Hachijo-Shima (Satow); Nagasaki (Rein); Deshima (Nuhn); and Hakodate.

Littorina sitchana Phil. Abbild., III, pl. 6, f. 13, 18.

Coast of Prov. Kii (Stearns) ; Hakodate (Schrenck).

Littorina subtenebrosa Midd. Reise, II, p. 202, pl. 11, f. 11, 12.

Peninsula Segneka, Ochotch Sea. (Midd.).

Littorina sinensis Phil. Abbild., III, pl. 6, f. 23.

Nagasaki (Lischke).

Littorina strigata Lischke. J. M. C., II, p. 73, pl. 5, f. 22.

Nagasaki (Lischke).

Littorina sieboldi Philippi. Abbild., III, pl. 6, f. 3.

Japan Sea (Siebold).

Littorina vidua. Otia Conch., p. 110.

Oushima (Stimp.).

Littorina (Hamus) granularis Gray. Challenger Gastrop., 1873–6, XV, p. 576.

Ooshima.

Fossarina picta A. Ad. P. Z. S., 1867, p. 312, pl. 19, f. 26.

Tanabe, Oki-no-Shima (Ad.).

Echinella (?) tectiformis Watson. Challenger Gastrop., 1873–6, XV, p. 578 ; pl. XLIII, f. 1.

Japan, 565 fathoms, green mud ; Lat. 34° 7′ N., Long. 128° E.

Echinella cecillei Philippi. (*Littorina*). Philippi, Zeitschr., 1851, p. 78.

Liu-Kiu Is. (Largilliert).

Echinella cumingii Phil. Japan (Stearns, 300 specimens).

Lacuna latifasciata Ad. Ann. Mag., 1863, p. 350.

Kino-o-Shima (Ad.).

Lacuna (Medoria) crassior Montg. Midd., Sib. Reise, pl. 10, f. 10. 11. (*L. glacialis* Moll.).

Japan (Dkr.).

Lacuna (Medoria) turrita A. Ad. Ann. Mag., 1861, p. 305 ; 1863, p. 350.

Rifunsiri (Ad.).

Lacuna (Epheria) divaricata Fabr. Man. Conch., VIII, p. 266.

Hakodate (Schrenck, as *L. vincta*).

Lacuna (Epheria) decorata A. Ad. Ann. Mag., 1861, 304.

Rifunsiri (Ad.).

Lacuna (Epheria) inflata A. Ad. Rifunsiri (Ad., *l. c.*).

Lacuna (Epheria) carinifera Ad. P. Z. S., 1851, p. 225.

Takano-Shima (Ad.).

Lacuna (Epheria) lepidula Ad. Ann. Mag., 1863, XI, p. 350.

Seto-Uchi, Akasi, 15 fms. (Ad.).

Lacuna unicarinata E. A. Smith. Ann. Mag., 1875, Vol. XVI, p. 104.

North Japan, on a littoral species of Sargassum (St. John).

Lacuna (Cithna) globosa A. Ad. P. Z. S., 1863, p. 113.

Seto-Uchi, Harima Nado (Ad.).

Lacuna (Cithna) spirata A. Ad. *L. c.*, same localities.

Lacuna oxytropis Pilsbry. Pl. VIII, fig. 1.

Shell acutely turbinate, rather thin, widely umbilicated, yellowish-brown, becoming olive on the spire; surface covered with a thin epidermis, sculptured by slight fine growth-lines only. Spire elevated, acute; whorls 4½, convex, separated by deep sutures, the last whorl with an acute pinched peripheral keel, which becomes obsolete at aperture, but extends up the spire immediately above the sutures. Aperture half round, outer lip well curved, inner lip about straight, retracted in the middle, thin; umbilicus rather large and deep, excavated, brown, and rather roughly longitudinally striate within, bounded by a very acute keel. Alt. 6½, diam. 5 mm.; apert. oblique alt. 4, width 3·7 mm.

Tokyo Harbor (F. Stearns).

Lacuna smithii Pilsbry. Pl. VIII, fig. 2.

Shell ovate, smooth, yellow, with white or white-edged apical whorls, and usually a white peripheral band; surface marked by growth-lines and some irregular wrinkles. Spire elevated but extremely obtuse; whorls 4, the latter 1½ demarked from the preceding by a dark line, the earlier whorls forming a depressed-globose, low-spired embryonic shell. Last whorl keeled at periphery, the keel becoming obsolete toward the lip, not visible on the whorls of the spire. Aperture oblique-ovate, inner lip arcuate and retracted in the middle; umbilicus moderate, pure white, deeply penetrating, surrounded by a very acute brown keel, excavated within. Alt. 5·6, diam. 4·2 mm.; aperture, oblique alt. 3·6, width 2·5 mm.

Tokyo Harbor (Stearns).

A very obtuse shell, less transversely inflated than *L. stenotomorpha* and with narrower umbilicus. This species is named in honor of Mr. E. A. Smith, whose contributions to our knowledge of Japanese shells have been of great extent and value.

Lacuna stenotomorpha Pilsbry. Pl. VIII, fig. 3.

Shell small, smooth, yellow, with a white band at periphery and another below the suture; depressed, oblique, with large, open, excavated white umbilicus. Spire low, last whorl very rapidly enlarging, descending in front, rounded at periphery. Aperture ovate, oblique, small; outer lip well curved, inner lip nearly straight. Umbilicus deep, encircled by an acute keel, excavated on its inner surface. Alt. 4, diam. 4 mm.; aperture, oblique alt. 3, width 2 mm.

Tokyo Harbor (Stearns).

In this species the form approaches *Stenotis laxata*. The last whorl is marked off from those preceding by a dark line, probably indicating the end of the larval stage. This is visible in the two other species herein described, but I do not notice it in the North Atlantic or Californian *Lacunas*. This feature may indicate a section or subgenus, which may be called *Sublacuna*.

Lacuna (Stenotis) laxata A. Ad. Journ. de Conchyl., 1868, p. 54, pl. 4, f. 7.

Idzuma-Nada, Inland Sea, 17 fms.; Yobuko, W. coast of Kiushiu, 14 fms. (Ad.).

FOSSARIDÆ.

Fossarus costatus Brocchi. Conch. Foss. Subap., p. 300, pl. 11, f. 11; *Fossar japonicus* A. Ad., Ann. Mag., 1861, p. 139.

Kuro-Shima, Tsu-Shima (Ad.).

Fossarus trochlearis A. Ad. P. Z. S., 1853, p. 187.

O-Shima (Ad.).

Fossarus fenestratus A. Ad. O-Shima (Ad.).

Couthouya decussata A. Ad. Ann. Mag., 1860, p. 410.

Mino-Shima (Ad.).

Couthouya reticulata A. Ad. P. Z. S., 1853, p. 186 (*Fossar*).

Seto-Uchi, Uraga (Ad.).

Couthouya striatula and **C. plicifera** A. Ad. Yobuko (Ad., *l. c.*)

Isapis lirata A. Ad. Ann. Mag., 1860, p. 120.

Mino-Shima, Uraga (A. Ad.).

Isapis conoidea A. Ad. Takano-Shima (Ad.).

Conradia cingulifera A. Ad. Ann. Mag., 1860, p. 410.

Mino-Shima, Uraga (Ad.).

Conradia carinifera A. Ad. Mino-Shima, Goto (Ad., *l. c.*).

Conradia clathrata A. Ad. Tsu-Shima, Goto (Ad.).

Conradia pulchella Ad. Ann. Mag., 1861, p. 307.

Tsu-Shima, Goto (Ad.).

Conradia doliaris Ad. Seto-Uchi (Ad., *l. c.*).

Conradia tornata A. Ad. Goto Is. (Ad., *l. c.*).

Gotoina sulcifera and **pyrgula** A. Ad. Goto Is.

SOLARIIDÆ.

Solarium perspectivum Linné. Man. Conch IX, p. 8. Nagasaki (Lischke).

Solarium maximum Phil. Japan (Stearns).

Solarium quadriceps Hinds. Nagasaki (Lischke).

Solarium cingulum Kiener. Hazaburo, Boshiu coast (Stearns).

Solarium conulum var. **japonicum** P. & S. Hazaburo, Boshiu coast (Stearns).

Shell similar in form to *S. conulum* Weink.; dark purple-brown above and below, the peripheral (supra-sutural) and subperipheral cords white, closely articulated with orange-brown; umbilical cord white. Alt. 8½, diam. 10 mm.; sometimes larger.

Torinia dorsuosa Hinds. Japan (Dkr.).

RISSOELLIDÆ.

Rissoella omphalotropis, vesicalis, spiralis A. Ad. Ann. Mag., VI, 1860, p. 332, 333.

Sado, 30 fms. (Ad.).

Rissoella vitrina, hydrophana A. Ad. (*Ibid*). Tabu-Shima, 25 fms.

Rissoella minima, mundula A. Ad. (*Ibid*). Tsu-Shima, 26 fms.

Rissoella turgidula A. Ad. (*Ibid*). Corea Strait, 46 fms.

Rissoella fulgida A. Ad. Dkr., Index, p. 117.

LITIOPIDÆ.

(See Ann. Mag. N. H., 1861, p. 143; 1862, p. 296).

Alaba picta, felina, lucida A. Ad. Takano-Shima.

Alaba leucosticta A. Ad. Tabu-Shima.

Alaba cornea A. Ad. Awa-Shima, Takano-Shima.

Alaba zebina, subangulata A. Ad. Tsu-Shima.

Alaba imbricata, inflata A. Ad. O-Shima.

Diala varia A. Ad. Awa-Shima, Takano-Shima.

Diala sulcifera Ad. O-Shima, Tanabe.

Diala tenuis E. A. Smith. Ann. Mag., 1875, Vol. XVI, p. 105.

N. Japan, on a littoral species of *Sargassum*. Many specimens collected by Stearns have egg-capsules (?) on the shell, probably such as Smith mentions. The shells are larger than Smith's, length 6 mm.

Diala simplex E. A. Smith. Ann. Mag., 1875, Vol. XVI, p. 105.

Lat. 41° 12′ N., Long. 140° 45′ E., 43 fath. (St. John).

RISSOIDÆ.

Rissoa (Goniostoma) pupaeformis A. Ad. Ann. Mag., V, 1860, p. 411.

Mino Shima, 63 fms. (A. Ad.).

Rissoa (Onoba) mundula A. Ad. Ann. Mag., 1861, VIII, p. 136.

Corea Strait, 63 fms. (Ad.).

Rissoa (Onoba) elegantula A. Ad. (*Ibid*). Gulf of Pechili, 7 fms.

Rissoa (Onoba) elegans A. Ad. Ann. Mag., XI, 1863, p. 348.

Seto-Uchi, 17 fms.; Yara, 9 fms. (Ad.).

Rissoa (Onoba) procera A. Ad. (*Ibid*). Yara, 9 fms.; Mososeki, 7 fms. (Ad.).

Rissoa (Onoba) mirifica A. Ad. (*Ibid*). Kino-o-Shima, Tanabe.

Rissoa (Onoba) bella A. Ad. (*Ibid*). Yara, 9 fms.

Rissoa (Onoba) spirata A. Ad. (*Ibid*). Mososeki, 7 fms.

Rissoa (Onoba) patula A. Ad. (*Ibid*). Yobuko, W. coast of Kiusiu, 14 fms.

Rissoa (Onoba) egregia A. Ad. (*Ibid*). Seto-Uchi, 17 fms.; Yobuko, 10 fms.

Rissoa (Onoba) lucida A. Ad. (*Ibid*). O-Shima.

Rissoa (Onoba) annulata Dkr. Moll. Jap., p. 12, pl. 2, f. 12.

Deshima.

Rissoa (Onoba) ferruginea A. Ad. Dkr., Index, p. 120.

Rissoa (Hyala) pumila A. Ad. Ann. Mag., 1870, VI, p. 123.

Japan (Ad.).

Rissoa (Hyala) glabrata (Phil.) Ad. Japan (Ad.).

Rissoa (Setia) candida A. Ad. Ann. Mag. (3), VIII, 1861, p. 136.

Sado Island, 30 fms. (Ad.).

Rissoa (Setia) tricincta, bifasciata Ad. *Ibid.* Awa-Shima, in shell-sand (A. Ad).

Rissoa (Alvania) circinata A. Adams. Ann. Mag. (3), VIII, 1861, p. 137.

Is. of Sado, 30 fms. (Ad.).

Rissoa (Alvania) semicostata A. Ad. *t. c.*, p. 137.

Mino-Shima, 63 fms. (Ad.).

Rissoa (Alvania) tiarula A. Ad. t. c., p. 137.

Tabu-Shima, 25 fms. (Ad.).

Rissoa (Alvania) ferruginea A. Ad. t. c., p. 138.

Hakodate Bay, 7 fms. (Ad.).

Rissoa concinna A. Ad. Conch. Icon., XX, pl. I, f. 9.

Tsu-Shima, 26 fms. (Adams).

Rissoa (Alvania) cælata, clathratula, mariella A. Adams. Ann. Mag. (3), VIII, p. 137, 138.

Tsu-Shima, 16–25 fms. (Ad.).

Rissoa (Alvania) pura Gld. Otia Conch., p. 146.

Simoda (Stimpson).

Rissoina costulata Dkr. Moll. Jap., p. 12.

Deshima (Dkr.); Kamakura (Stearns).

Rissoina plicatula Gould. Conchyl. Cab., p. 72, pl. 15b, f. 5.

Bonin Is. (Stimpson).

Rissoina (Rissolina) lyrata Gld. Otia Conch., p. 145.

Oushima (Stimpson).

Rissoina (Rissolina) monilifera Nevill. Moll. Ind. Mus., Calcutta, p. 79.

Japan (A. Adams).

Rissoina (Rissolina) canaliculata Schwartz v. Mohrenst. Fam. der Riss., p. 55, f. 18.

Japan (Dkr.).

Rissoina (Rissolina) subfuniculata Nev. Weink., C. Cab., pl. 15b, f. 8.

Kachiyama (Dunker).

Rissoina (Microstelma) dædala A. Ad. (3), XI, 1863, p. 348.

Goto Is., 48 fms. (A. Ad.).

Rissoina (Phosinella) cancellata Phil. Man. Conch., IX, p. 381,

Japan (Dkr.).

Rissoina (Phosinella) sagraiana d'Orb. Moll. Cuba, II, p. 25, pl. 12, f. 4, 5.

Deshima (Dkr.).

Rissoina (Phosinella) nitida A. Ad. P. Z. S., 1851, p. 226.

Japan (Dkr.).

Rissoina (Zebinella) concinna A. Ad. Dkr., Index, p. 118.

Japan (Dkr.).

Rissoina (Zebinella) adamsiana Wkff. Conchyl. Cab., p. 67, pl. 15a, f. 4.

Kachiyama, 25 fath., sand (Dkr.).

Rissoina (Moerchiella) spirata Sowb. Man. Conch., p. 388.

Rissoina (Moerchiella) striolata A. Ad. P. Z. S., 1851, p. 266.

Japan (Dkr.). A synonym of *R. spirata* Sowb. according to Tryon.

Rissoina (Moerchiella) japonica Wkff. Conchyl. Cab., p. 65, pl. 15a, f. 1.

Japan (Weinkauff; Nevill).

Rissoina (Zebina) subulina Wkff. Conchyl. Cab., p. 66, pl. 15a, f. 3.

Japan (A. Adams).

Rissoina (Pyramidelloides) miranda A. Ad. Conchyl. Cab., p. 69, pl. 15a, f. 8.

Mino-Shima (A. Ad.).

Rissoina (Stossichia) pseudoconcinna Nevill. Hand-List Moll. Ind. Mus., p. 98; Conchyl. Cab., p. 85, pl. 15a, f. 8.

Japan (A. Ad.). Syn.: *R. concinna* Sowb. not Ad.

Hydrobia plicosa E. A. Smith. Ann. Mag., 1875, Vol. XVI, p. 104.

Auomori, 7 fathoms (St. John).

Iravadia trochlearis Gould. Conchyl. Cab., p. 72, pl. 15b, f. 2.

Deshima, Nagasaki (Nuhn).

Fenella pupoides A. Ad. Journ. de Conch., XVI, p. 47, pl. 4, f. 5.

Takano-Shima, Tsu-Shima (Ad.).

Fenella fusca A. Ad. Ann. Mag., 1860, p. 119. (*Dunkeria*).

Tabu-Shima, Sea of Japan, 25 fathoms (Ad.).

Fenella scabra A. Ad. Ann. Mag., VI, 1860, p. 421. (*Dunkeria*).

Tsu-Shima, 16 fms. (Ad.).

Fenella ferruginea A. Ad. Ibid. (*Dunkeria*).

Sado, 30 fms.

Fenella asperulata, pulchella A. Ad. Ann. Mag., VI, 18 60, p. 120 (*Dunkeria*).

Mino-Shima, 63 fms. (Ad.).

Fenella rufocincta A. Ad. Ann. Mag., VIII, 1861, p. 300. (*Dunkeria*).

Moso-Seki, Takano-Shima (Ad.).

Fenella reticulata A. Ad. Ann. Mag., VI, 1860, p. 422. (*Dunkeria*).

Awa-Shima, low water (Ad.).

Fenella craticulata A. Ad. Mino-Shima, 63 fms. (Ad.).

Putilla lucida A. Ad. Man. Conch., IX, p. 396, pl. 60, f. 85.

Goto Is. (Ad.).

Scaliola bella Ad. Journ. de Conch., XVI, p. 53, pl. 4, f. 6.

Off Tabu-Shima, 25 fms.; Takano-Shima, at Tatiyama (Ad.).

Scaliola arenosa A. Ad. Ann. Mag., 1862, p. 421.

O-Shima, Tanabe, Simoda (Ad.).

Scaliola glareosa A. Ad. *l. c.*, p. 421.

Tsu-Shima, Takano-Shima (Ad.).

Scaliola gracilis A. Ad. *Ibid.* Goto Is. (Ad.).

SKENEIDÆ.

Skenea cornuella A. Ad. Ann. Mag., 1860, V, p. 412.

Off Mino-Shima, 63 fms. (Ad.).

ASSIMINEIDÆ.

Assiminea japonica v. Marts. Jahrb. D. M. G., 1887, p. 182.

Yokohama, brackish water.

Assiminea castanea West. Vega-Exp. Vetenskap. Iattag., IV, p. 210, pl. 5, f. 26.

Yokohama (Vega Exp.).

Assiminea atomaria Phil. Abbild., II, p. 136, pl. 2, f. 6 (Paludina).

Japan (Nevill); Tokyo Harbor, Kamakura (Stearns).

Assiminea cincta A. Ad. Jahrb. D. M. G., 1887, p. 169.

Japan (Paetel).

Assiminea subcornea Nev. Jahrb. D. M. G., 1887, p. 205.

Japan? (Nevill).

Assiminea savatieri Mabille (Anculotus).

Kamakura (Stearns). The radula resembles that of *A. francesi*, but the admedian teeth are not divided as Troschel's figure shows.

CAPULIDÆ.

Capulus badius Dkr. Index, p. 124, pl. 13, f. 15–17.

Inland Sea (Dkr.).

Capulus japonicus A. Ad. Ann. Mag. N. H., 1861, p. 168.

Mino-Shima (Ad.).

Capulus (Capulacmæa) dilatatus A. Ad. Index, p. 124, pl. 12, f. 12–14; Ann. Mag., 1860, p. 422.

Mino-Shima.

Capulus (Capulacmæa) radiatus Sars. Man. Conch., VIII, p. 132, pl. 40, f. 86, 87 (*Pilid. commodum* Midd.)

Capulus (Amathina) tricostata Gmel. Man. Conch., VIII, p. 133.

Kobé, 8 fathoms, mud (Chall.).

Capulus (Amathina) angustata Souv. Japan (Dkr., Index, p. 125).

Capulus (Amathina) nobilis A. Ad. P. Z. S., 1867, p. 312, pl. 19, f. 27.

Saghalien I.

Crepidula grandis Midd. Dkr., Index, p. 123, pl. 6, f. 1, 2.

Akishi, 3 fath. (St. John); Kishiu (Stearns).

Crepidula aculeata Gmel. Inland Sea, Kishiu and Enoshima (Stearns); Kobé, 8 to 50 fathoms (Challenger); Nagasaki (Lischke).

Crepidula walchi Herrm. *Calyptræa plana* Ads. & Rve. Zool. Samarang, pl. 11, f. 3.

Japan (Stearns).

Crepidula lamellosa A. Ad. Ann. Mag., 1862, p. 297.

Goto Is. (A. Ad.).

HIPPONICIDÆ.

Hipponyx pilosus Desh. Moll. Jap., p. 15; J. M. C., II, p. 78.

Nagasaki (Lischke); Deshima (Nuhn); Yokohama (Martens).

Hipponyx foliaceus Q. & G. Zool. Astrol., III, p. 439, pl. 72, f. 41–45.

Near Enoshima (Stearns).

Hipponyx australis Q. & G. Man. Conch., VIII, p. 136.

Deshima (Dkr.); Nagasaki (Lischke); near Enoshima, Awa coast (Stearns, abundant on *Haliotis gigantea*); Hakodate (Schrenck)

XENOPHORIDÆ.

Xenophora exuta Reeve. C. Syst., II, pl. 225, f. 9, 10.

Nagasaki (Lischke); E. Coast Nippon (Stearns).

Xenophora pallidula Reeve. Jap. M. C., III, pl. 3, f. 1–3.

Bay of Yedo (Lischke); E. Coast Nippon (Stearns).

Xenophora solarioides Reeve. Zool. Samarang, p. 50, pl. 17, f. 6.

Japan (Dkr.).

VANIKORIDÆ.

Vanikoro cancellata Lam. *Narica cancellata* Dkr., Index, p. 126.

Japan Sea (Dkr.).

Vanikoro japonica n. sp. Pl. I, figs. 5, 5.

Shell globose, about as high as wide, solid, white; spire convex, low; whorls 3, rapidly increasing, the last sculptured with many subequal spiral cords as wide as their microscopically spirally striated intervals, decussated by growth-wrinkles; but at its origin

showing three prominent keels. Young shells having three strong keels with latticed intervals, the pits oblong and very deep, base with two low spirals; when a diam. of 5 or 6 mm. is reached the lattice becomes more superficial, the primary keels decrease and intermediate liræ appear. Aperture large, outer lip forming a half-circle, columella less arched, moderately calloused; umbilicus penetrating to apex, but a mere perforation at all stages of growth; narrowly but distinctly grooved behind the columellar lip. Alt. 16, diam. 16 mm.

Chikewa, Boshiu (Stearns).

The narrow vertical pits of the earlier whorls are peculiar, and very unlike the square pits of the young *V. cancellata*. The latter, moreover, is not tricarinate in the young state.

Vanikoro scalarina Gld. Otia, p. 110.

Loo Choo (Stimpson).

NATICIDÆ.

Natica tæniata Menke. Tryon, Man. Conch., VIII, pl. 4, f. 62, 64.

Chikiwa, Boshiu (Stearns).

Natica pellistigrina Chemn. Man. Conch,, VIII, p. 16, pl. 2, f. 33.

Nagasaki (Lischke); Deshima (Dkr.).

Natica colliei Recl. Ann. Mag., 1875, p. 427.

Matoza Harb., 6 fath., sand (St. John).

Natica concinna Dunker. Dkr., Moll. Jap., p. 14, pl. 2, f. 21; *N. bicincta*, Schrenck, Amurl. Moll., p. 377, pl. 17, f. 1–3.

Deshima and Yedo (Dkr.); Hakodate (Schrenck); Japan (Stearns).

Tryon considers *concinna* Dkr. and *bicincta* Sch. as synonyms of *colliei* Recl. There cannot be much doubt that the former two are specifically identical.

Natica lurida Phil. Chikiwa, Boshiu (Stearns, typical specimens).

Natica adamsiana Dkr. Dkr., Index, p. 61, pl. 13, f. 5, 6; Moll. Jap., p. 14, pl. 2, f. 20.

Banda, Boshiu (Stearns); Deshima (Dkr.).

Natica janthostoma Desh. Rve., C. Icon., pl. 18, f. 79.

Banda, Boshiu (Stearns); Nemero, E. Yedo (St. John); Yedo, Hakodate (Lischke).

Natica clausa Brod. & Sowb. (*? affinis* Gmel.). Shantar I. (Schrenck). Compare preceding and following forms.

Natica operculata Jeffreys. P. Z. S., 1885, p. 34, pl. 4, f. 7, 7a.

North Japan (St. John).

Polinices[1] **melanostoma** Gmel. Man. Conch. VIII, p. 50.

Japan (Stearns).

Polinices simiæ Desh. Rve., Conch. Icon., pl. 17, f. 76; pl. 22, f. 98a, b (Good!)

Polinices powisianus Recluz. Tryon, Man. Conch., VIII, p. 42; Dkr., Index, p. 62.

Yokohama (Dkr.); Nagasaki (Lischke).

Polinices powisianus v. **draparnaudii** Recl. Japan (Stearns).

The single specimen secured by Mr. Stearns differs from *N. powisiana* var. *draparnaudii* Recl. in having the spiral umbilical funicle very heavy and strong, much more filling the umbilicus, and the edge of the umbilicus is produced in *a very strong spiral bounding rib.*

Polinices mamilla Linn. Man. Conch., VIII, p. 49.

Nemoto, Boshiu (Stearns). Lischke reports the synonym or variety *pyriformis* Recl. from Bay of Yedo.

Polinices (**Lunatia**) **reiniana** Dkr. Index, p. 62, pl. 4, f. 15, 16.

Japan (Dkr.).

Polinices (**Lunatia**) **severa** Gld. Otia Conch., p. 109.

Hakodate Bay (Stimpson).
Compare *Neverita reiniana* Dkr.

Polinices pallidus B. & S. Shantar I. (Schrenck).

Polinices (**Neverita**) **ampla** Phil. Ph., Conch. Cab. ed. 2, pl. 6, f. 2; Tryon, Manual Conch., VIII, p. 32.

Tokyo to Enoshima, Henda, Shibo, Boshiu (Stearns).

The extensive synonymy of this magnificent *Neverita* has been ably discussed by Tryon.

Amaura (**Acrybia**) **flava** Gld. (*aperta* Lovén). Midd., Reise I, p. 206, pl. 9, f. 1–3.

Sigaretus insculptus Ads. & Rve. Zool. Samarang, p. 55, pl. 13, f. 10.

Wakayama, Inland Sea (Dkr.).

[1] Montfort, Conch. Syst., II, p. 222. This genus contains Naticas with corneous operculum, the term *Natica* being restricted to species with the operculum shelly. The type of *Polinices* is *Natica mamillaris* Lam.; not *N. mammilla* Linn. as Dall states; Montfort's *Polinices albus* being identical with the former species.

Sigaretus undulatus Lischke. Lischke, J. M. C., III, p. 54, pl. 3, f. 11–14.

Yokohama (Stearns); Yedo (Lischke).

Sigaretus japonicus Lischke. Jap. M. C., III, p. 55, pl. 3, f. 15–17.

Yedo (Lischke).

Sigaretus (Eunaticina) papilla Gmelin. Conchyl. Cab., p. 38, pl. 9, f. 4–6; pl. 10, f. 8.

Yokohama (Stearns); Bay of Yedo (Lischke); Deshima (Nuhn).

Velutina cryptospira Midd. Man. Conch. VIII, p. 67.

Inland Sea (Stearns).

ADEORBIIDÆ.

(For descriptions and figures see also Man. Conch. X, p. 83-87.)

Adeorbis planus A. Ad. Conch. Icon., Vol. 19, pl. 1, f. 4.

Japan.

Adeorbis depressus A. Ad. Conch. Icon., Vol. 19, pl. 1, f. 6, a, b.

Mino-Shima (Adams).

Adeorbis orbellus A. Ad. Conch. Icon., Vol. 19, pl. 1, f. 9.

Mino-Shima (Adams).

Adeorbis clausus A. Ad. Conch. Icon., Vol. 19, pl. 2, f. 14 a, b.

Mino-Shima (Adams).

Adeorbis japonicus A. Ad. Conch. Icon., Vol. 19, pl. 2, f. 11.

Goto Is. (Adams).

Adeorbis prominulus A. Ad. Conch. Icon., Vol. 19, pl. 2, f. 13.

Mino-Shima (Adams).

Adeorbis nanulus A. Ad. Conch. Icon., Vol. 19, pl. 2, f. 18.

Mino-Shima (Adams).

Adeorbis trochulus A. Ad. Conch. Icon., Vol. 19, pl. 1, f. 8.

Goto Is. (Adams).

Adeorbis patruelis A. Ad. Conch. Icon., Vol. 19, pl. 2, f. 21 a, b.

Mino-Shima (Adams).

Adeorbis subangulatus A. Ad. Conch. Icon., Vol. 19, pl. 2, f. 19.

Goto Is. (Adams).

Adeorbis carinatus A. Ad. Conch. Icon., Vol. 19, pl. 1, f. 10 a, b.

Seto-Uchi (Adams).

Archytæa suturale A. Ad. Conch. Icon., Vol. 19, (*Adeorbis*) pl. 2, f. 15 a, b.

Tsu-Shima (Adams).

Archytæa corniculum A. Ad. Conch. Icon., Vol. 19, (*Adcorbis*) pl. 2, f. 16 a, b.

Mino-Shima (Adams).

Archytæa diaphanum A. Ad. Conch. Icon., Vol. 19, (*Adcorbis*) pl. 2, f. 20 a, b.

Goto Is. (Adams).

IANTHINIDÆ.

Ianthina fragilis Lam. Bay of Yedo (Lischke).

Ianthina fragilis Lam. var. **planispirata** A. & R. Voy. Samarang Zool., pl. 11, f. 10.

Japan (Stearns).

Ianthina balteata Reeve. Bay of Yedo (Lischke).

Ianthina exigua Lam. Tryon, Man. Conch., IX, pl. 10, f. 17.

Japan (Stearns).

Ianthina globosa Swains. Tryon, Man. Conch., IX, pl. 10, f. 11–14.

Japan (Stearns); Bay of Yedo (Lischke).

Some specimens are pure white.

SCALIDÆ.

Scala pallasii Kiener. Thes., p. 83, pl. 32, f. 16;

Corea Strait, 46 fms. (Ad.); Nagasaki (Lischke).

Scala aculeata Sowb. Thes., p. 86, f. 35–37.

Tsu-Shima, 16 fms. (Ad.); Bay of Yedo (Lischke).

Scala replicata Sowb. Thes., p. 84, f. 23, 24.

Mino-Shima, 63 fms. (Ad.).

Scala obliqua Sowb. Thes., p. 89, f. 69.

Mino-Shima, 63 fms. (Ad.).

Scala muricata Kiener. Thes., p. 86, f. 29, 31, 32.

Mino-Shima, 63 fms. (Ad.).

Scala pulcherrima Sowb. Thes., p. 97, f. 92.

Mino-Shima, 63 fms. (Ad.).

Scala lineolata Sowb. Thes., p. 91, f. 45, 46, 48.

Scala trifasciata de Haan. Thes., f. 44.

Tokyo Harbor, Yokohama (Stearns).

Scala latefasciata Sowb. C. Icon., f. 117a.

Tokyo Harbor (Stearns).

Scala japonica Dkr. Moll. Jap., p. 13, pl. 1, f. 13.

Deshima (Nuhn).

Scala angusta Dkr. Moll. Jap., p. 13, pl. 1, f. 11.

Deshima (Nuhn).

Scala lyra Sowb. Thes., p. 89, f. 38, 39, 81, 82.

Bay of Yedo (Lischke).

Scala aurita Sowb. Kamakura, Yokohama, Tokyo Harbor (Stearns).

Scala immaculata Sowb. Japan (Dkr.).

Scala acuminata Sowb. Thes., p. 106, f. 130.

Bay of Yedo (Lischke).

Scala rubrolineata Sowb. Thes., p. 91, f. 83, 84; Ad., Ann. Mag., 1861, p. 479.

Mino-Shima, 63 fms. (Ad.).

Scala turricula Sowb. (?). Corea Strait, 46 fms. (Ad.); Kamakura (Stearns).

The specimens are probably not this West Indian species, but seem nearer it than anything else.

Scala irregularis Sowb. Thes., p. 90, f. 40, 60.

Mino-Shima, 63 fms. (Ad.).

Scala trabeculata, fimbriata, optabilis, elegantula, spiralis, liliputana A. Ad. Ann. Mag., 1861, p. 480, 481.

Mino-Shima, 63 fms.

Scala præclara A. Ad. Corea Strait, 46 fms. (Ad., *l. c.*).

Scala eximia Ads. & Rve. Zool. Samarang, pl. 11, f. 16.

Mino-Shima, 63 fms. (A. Ad.).

Scala soluta A. Ad. Ann. Mag., 1862, p. 296.

Port Lindsay (A. Ad.).

Scala hexagona Sowb. Thes., p. 198, f. 67.

Awa-Shima, in shell-sand (Ad.).

Scala elenensis Sowb. Thes., p. 98, f. 102.

Mino-Shima, 63 fms. (Ad.).

Scala casta A. Ad. Man. Conch. IX, p. 67.

Yokohama, Tokyo Harbor, Kamakura (Stearns).

Scala pumila A. Ad. Conch. Icon., XIX, pl. 11, f. 79.

Japan (Adams).

Scala tenuilirata Sby. Conch. Icon., XIX, pl. 15, f. 118.

Japan (Sby.).

Scala (Amæa) magnifica Sowb. Thes. p. 102, f. 103.

Mino-Shima, 63 fms. (Ad.).

Scala (Amæa) kieneri Canefri. (*decussata* Sowb., not Lam.; *sowerbyi* Dkr.) Thes., p. 103, f. 140.

Mino-Shima, 63 fms. (Ad.).

Scala (Amæa) immaculata Sowb. Thes., p. 93, f. 58.

Bay of Yedo (Lischke); Tokyo Harbor (Stearns).

Scala (Cirsotrema) sulcata Sowb. Bay of Yedo (Lischke).

Scala (Cirsotrema) bicarinata Sowb., **crassilabrum** Sowb., **turbonilla** A. Ad. Mino-Shima, 63 fms. (Ad., Ann. Mag., 1861, VIII, p. 482, 483).

Scala (Cirsotrema) suturalis Hinds., **undulata** Sowb. Corea Strait, 46 fms. (Ad.).

Scala (Cirsotrema) cribraria A. Ad. Tsu-Shima, 26 fms. (A. Ad., Ann. Mag., 1861, p. 483).

Scala (Constantia) elegans A. Ad. (*S. jucunda* Canefri) Mino-Shima, 63 fms. (Ad.).

Scala (Constantia) tantilla A. Ad. Tabu-Shima (A. Ad.).

Scala (Opalia) exquisita A. Ad. Ann. Mag., 1864, p. 310.

Goto Is.

Scala (Opalia) lamellosa Lam. Tryon, Man., IX, p. 74.

Yokohama; Kamakura (Stearns).

I cannot distinguish these from Atlantic specimens.

Scala (Opalia) ochtensis Midd. Sib. Reese, pl. 12, f. 12–14.

Nichta Bay, Ochotch Sea.

Crossea miranda A. Ad. J. de Conch., XVI, 1868, p. 55, pl. 4, f. 9.

Goto Is. (Ad.).

Crossea bellula A. Ad. *L. c.* p. 56, pl. 4, f. 10. Same locality.

Eglisia cumingii A. Ad. P. Z. S., 1850, p. 204.

Japan (Ad.).

Aclis (Iolæa) scitula A. Ad. Journ. de Conch., 1868, pl. 4, f. 3.

Mino-Shima; Seto-Uchi (Ad.).

Aclis (Iolæa) amabilis A. Ad. O-Sima; Tanabe; Goto (Ad.).

Aclis (Iolæa) sculptilis A. Ad. Mino-Shima; Yobuko (Ad.).

Aclis labiata, cingulata, lirata, sulcata A. Ad. Ann. Mag., 1860, p. 118.

Off Mino-Shima, 63 fms. (Ad.).

Aclis (Ebala) virginea, vestalis A. Ad. Off Mino-Shima, 63 fms. (Ad., *l. c.* p. 119).

Aclis (Ebala) scintillans A. Ad. Sado (Ad., Ann. Mag., 1861, p. 43).

Aclis crystallina, fulgida A. Ad. Tsu-Shima (Ad., Ann. Mag., 1861, p. 43).

EULIMIDÆ.

Eulima robusta A. Ad. Man. Conch., VIII, p. 271, pl. 68, f. 25.

Mino-Shima, 63 fms. (Ad.); Kamakura (Stearns).

Eulima mundula A. Ad. Man. Conch., VIII, p. 272, pl. 68, f. 26.

Tsu-Shima, 16–26 fms. (Ad.).

Eulima clavula, curvata. stylata, pinguicula, acicularis, flexa, valida, odontoidea, chrysallida, debilis, indeflexa A. Adams. Ann. Mag. N. H., VII, 1861, p. 125–128.

Mino-Shima, 63 fms. (Ad.). All unfigured and wretchedly described.

Eulima pandata, dentaliopsis A. Ad. *l. c.* Corea Strait, 46 fms. (Ad.).

Eulima reclinata, stenostoma, semitorta, eburnea A. Ad., *l. c.* Tabu-Shima, 25 fms. (Ad.).

Eulima angulata, scitula A. Ad. *l. c.* Tabu-Shima, 25 fms. (Ad.).

Eulima carneola Gld. Otia Conch., p. 148.

Oushima (Stimpson).

Eulima cumingii Sowb. Man. Conch., VIII, p. 267.

Tokyo Harbor (Stearns).

Eulima (Leiostraca) vincta A. Ad. Man. Conch., VIII, p. 280, pl. 20, f. 77.

Bingo-Nada; Harima-Nada (Ad.).

Eulima (Leiostraca) nivea A. Ad. Man. Conch., VIII, p. 281, pl. 20, f. 84.

Tsu-Shima, 26 fms.; Goto; Mino-Shima (Ad.).

Eulima (Leiostraca) pura A. Ad. Man. Conch., XIII, p. 281, pl. 20, f. 85.

Tsu-Shima, 26 fms.; Mino-Shima, 63 fms.; Asaki and Mososeki, Seto-Uchi (Ad.).

Eulima (Leiostraca) paxillus A. Ad. Man. Conch., VIII, p. 281, pl. 20, f. 86.

Mino-Shima; Goto, 63 fms. (Ad.).

Sowerby makes *Leiostraca clara* A. Ad. a synonym.

Eulima (Leiostraca) mariæ A. Ad. Man. Conch., VIII, p. 281, pl. 70, f. 87.

Eulima (Leiostraca) turgidula A. Ad. Ann. Mag. (3), VII, p. 128, 1861.

Tsu-Shima, 16 fms.; Goto (Ad.).

Eulima (Leiostraca) lanceata A. Ad. *l. c.* Seto-Uchi; Mino-Shima; Goto (Ad.).

Eulima (Leiostraca) mixa, leachii, spiculum, labiata A. Ad., *l. c.* Mino-Shima, 63 fms. (Ad.).

Eulima (Leiostraca) clavella A. Ad., *l. c.* p. 129.

Sado, 30 fms., on nullipore (Ad.).

Eulima (Leiostraca) nitida A. Ad., *l. c.* Okosiri, 25 fms.; Yobuko.

Eulima (Leiostraca) mindorensis Ads. & Rve. Zool. Samarang, pl. 11, f. 25.

Seto-Uchi (A. Ad.).

Eulima (Leiostraca) hastata, subulina, picturata, bizona A. Ad. Journ. Linn. Soc., VII. p. 85, 87, 88.

Goto, 48 fms. (A. Ad.).

Eulima (Leiostraca) lepida A. Ad. *Ibid*, p. 85.

Seto-Uchi; Yobuko (A. Ad.).

Eulima (Leiostraca) miranda, oberon, crystallina, pusio, nana, cigenda, inquinata, spreta A. Ad. *Ibid*, pp. 85, 86, 89, 90.

Yobuko (A. Ad.).

Eulima (Leiostraca) metulina, exigua, circinata, tæniata, tantilla A. Ad. *Ibid*, p. 86, 87, 88.

Akasi, Seto-Uchi (A. Ad.).

Eulima (Leiostraca) pistillum A. Ad. *Ibid*, p. 86.

Harima-Nada, Seto-Uchi (A. Ad.)

Eulima (Leiostraca) pusilla, pygmæa, cinctella, scitula A. Ad. *Ibid*, p. 86.

Mososeki, Seto-Uchi (Ad.).

Eulima (Leiostraca) ariel A. Ad. Ann. Mag., 1861.

Bingo-Nada, Seto-Uchi (Ad.).

Eulima (Leiostraca) pumila, balteata, gracilenta A. Ad. Journ. Linn. Soc., VII, p. 87.

Uraga.

Eulima (Leiostraca) bilineata Ads. & Rve. Samarang, pl. 11, f. 24.

Uraga; Seto-Uchi (Ad.); Tokyo Harbor (Stearns); *L. bivittata* Ads., Genera.

Eulima (Leiostraca) lentiginosa A. Ad. Dkr., Index, p. 90.

O-Shima, Mososeki, Seto-Uchi.

Eulima (Leiostraca) conspurcata A. Ad. *Ibid*, Takano-Shima (Ad.).

Eulima (Leiostraca) bifascialis A. Ad. *Ibid*, p. 88.

Bingo-Nada; Suwo-Nada (Ad.).

Eulima (Leiostraca) interrupta A. Ad. *Ibid*, p. 89.

O-Shima (Ad.).

Eulima (Leiostraca) crassula A. Ad. *Ibid*, p. 90.

O Shima.

Eulima (Apicalia) gibba A. Ad. Ann. Mag., 1862, p. 295.
Goto Is.

Eulima (Mucronalia) bicincta A. Ad. Ann. Mag., 1860, p. 301.
Mino-Shima, 63 fms. (Ad.).

Eulima (Mucronalia) exilis A. Ad. Ann. Mag., 1862, p. 295.
Mososeki, Seto-Uchi (Ad.).

Eulima (Mucronalia) lactea A. Ad. Proc. Linn. Soc. Lond., VII, p. 91, 1864.
Tanabe (A. Ad.).

Eulima (Mucronalia) subula A. Ad. Proc. Linn. Soc. Lond., VII, 1864, p. 91.
Simoda (Ad.).

Eulima (Selma) succiniola A. Ad. *l. c.* O-Shima (Ad.).

Eulima (Styliferina) orthochila A. Ad. Ann. Mag. N. H. (3), VI, p. 335.
Tsu-Shima, on *Asterias* (A. Ad.).

Eulima (Styliferina) gonochila A. Ad. *Ibid.* Mino-Shima, on *Ophiura* (A. Ad.).

Eulima (Styliferina) lepida A. Ad. Ann. Mag., 1862, p. 299.
Yobuko (Ad.).

Amaurella japonica A. Ad. Man. Conch., VIII, p. 286, pl. 70, f. 16.
Corea Strait. Originally described as *Macrocheilus.*

Amaurella glabrata A. Ad. *l. c.*, f. 12; P. Z. S., 1867, p. 311.
Takano-Shima, (Ad.).

Amaurella semistriata A. Ad. *t. c.*, p. 287, pl. 70, f. 17.
Oki-no-Shima (Ad.).

Niso interrupta Sowb. Thes., II, p. 801, pl. 170, f. 9.
Mino-Shima, Simonoseki (Ad.).

Niso brunnea Sowb. Thes., II, p. 801, pl. 170, f. 13.
Mino-Shima (Dkr.).

PYRAMIDELLIDÆ.

The systematic values of the groups of this family are here given according to Tryon and Fischer, but there are undoubtedly more genera. Most of the species enumerated below are not recognizably described. See for the figured ones, Tryon, Man. Conch. vol. VIII.

Pyramidella pulchella A. Ad. *Obeliscus.* P. Z. S., 1862, p. 232; Thes., II, p. 807, = J. beria
20/ pl. 171, f. 31, 32; Ann. Mag., 1875, p. 427.
Goza Harbor, 6 fath. (St. John); Mososeki (A. Ad.); Bay of Yedo (Lischke).

Pyramidella teres A. Ad. P. Z. S., 1862, p. 232; Thes., II, p. 807, pl. 171, f. 31, 32.

Mino Shima (Ad.).

Pyramidella balteata A. Ad. P. Z. S., 1862, p. 232; Thes., pl. 171, f. 25.

Yobuko, Uraga (Ad.).

Pyramidella pusilla A. Ad. P. Z. S., 1862, p. 232; Thes. II, pl. 171, f. 7.

O Shima, Takanoshima (Ad.).

Pyramidella eburnea A. Ad. P. Z. S., 1862, p. 232.

O-Shima (Ad.).

Pyramidella trifasciata A. Ad. P. Z. S., 1862, p. 232.

Uraga, Mososaki (Ad.).

Pyramidella vitrea A. Ad. (*Syrnola, Obeliscus*). P. Z. S., 1862, p. 232.

Uraga, Tsu-Shima (A. Ad.).

Pyramidella (Tiberia) nitidula Ad. P. Z. S., 1862, p. 232; Thes., pl. 171, f. 7.

Mino-Shima, 63 fath., Oshima, 25 fath. (Ad.).

Pyramidella (Otopleura) mitralis A. Ad. Tryon, Man. Conch., VII, p. 305. pl. 73, f. 94.

Japan (Stearns).

Pyramidella (Lonchæus) sulcata A. Ad. Tryon, Man. Conch., VIII, p. 301, pl. 72, f. 79.

Japan (Stearns).

Pyramidella (Syrnola) solidula Dkr. Moll. Jap., p. 15, pl. 1, f. 5.

Deshima (Dkr.); Kamakura (Stearns).

Pyramidella (Syrnola) hyalina Dkr. *t. c.*, pl. 1, f. 9.

Deshima, (Dkr.); Kamakura (Stearns).

Pyramidella (Syrnola) tenuisculpta Lischke. Jap. Meeres-Conch., III, p. 58, pl. 3, f. 7, 8.

Bay of Yedo (Lischke).

Pyramidella (Syrnola) aciculata A. Ad. P. Z. S., p. 223, 1862; Man. Conch., VIII, p. 306, pl. 73, f. 10.

Tanabe (Ad.).

Pyramidella (Syrnola) bizonalis A. Ad. P. Z. S., 1862, p. 233.

Mino-Shima (Adams).

Pyramidella (Syrnola) elegans A. Ad. P. Z. S., 1862, p. 233; Man. Conch. VIII, p. 306, p. 73, f. 7.

O-Shima, Seto-Uchi (Ad.).

Pyramidella (Syrnola) lactea A. Ad. P. Z. S., 1862, p. 234.

O-Shima.

Pyramidella (Syrnola) cinctella Ad. P. Z. S., 1862, p. 232: Man. Conch. VIII, pl. 307, p. 73, f. 14; Ann. Mag., 1875, p. 427.

O Shima, Seto-Uchi (Ad.); Matoza Harbor, 6 fms; sand, (St. John); Tokyo Harbor (Stearns).

Pyramidella (Syrnola) brunea A. Ad P. Z. S., 1862, p. 233; Man. Conch., VIII, p. 306, pl. 73, f. 8. 9.

O Shima (Ad.); Bishiu (Stearns). *P. fulva* Sowb. is a synonym.

Pyramidella (Syrnola) buxea Gld. P. Z. S., 1862, p. 234.

Takano-Shima (Stimp.).

Pyramidella (Syrnola) columnella A. Ad. P. Z. S., 1862, p. 235.

Seto-Uchi, Mososeki.

Pyramidella (Syrnola) cylindrella A. Ad. P. Z. S., 1862, p. 234; Man. Conch., VIII, p. 307, pl. 73, f. 17.

Takano-Shima (Ad.).

Pyramidella (Syrnola) dædala A. Ad. P. Z. S., 1862, p. 235.

Uraga.

Pyramidella (Syrnola) gracillima A. Ad. P. Z. S., 1862, p. 233; Man. Conch., VIII, p. 307, pl. 73, f. 13.

Mino-Shima, Uraga (Ad.).

Pyramidella (Syrnola) mera A. Ad. P. Z. S., 1862, p. 232.

Mino-Shima, O-Shima.

Pyramidella (Syrnola) pistillum A. Ad. P. Z. S., 1862, p. 234.

Yobuko (Ad.).

Pyramidella (Syrnola) pupina A. Ad. P. Z. S., 1862, p. 233.

Mososaki, Mino-Shima (Ad.).

Pyramidella (Syrnola) serotina A. Ad. P. Z. S., 1862, p. 234; Man. Conch., VIII, p. 308, pl. 73, f. 21.

Takano-Shima (Ad.).

Pyramidella (Syrnola) striatula A. Ad. Thes., p. 812, pl. 171, f. 29.

Seto-Uchi (Ad.).

Pyramidella (Syrnola) subulina A. Ad. P. Z. S., 1862, p. 234; Man. Conch., VIII, p. 308, pl. 73, f. 23.

Takano-Shima (Ad.).

Pyramidella (Syrnola) teretiuscula A. Ad. P. Z. S., 1862, p. 233.

Tsu-Shima, 15 fath. (Ad.).

Pyramidella (Amathis) virgo A. Ad. Ann. Mag. N. H., 1861, VIII, p. 304.

Corea Strait, 46 fms. (Ad.). Described as *Myonia*.

Pyramidella (Amathis) producta A. Ad. (*Odostomia*). Ann. Mag. N. H., VI, 1860, p. 416.

Sado, 30 fms., Tabu-Shima, 25 fms. (Ad.).

Pyramidella (Amathis) pellucida, eburnea, concinna A. Ad. Ann. Mag., 1861, VIII, p. 304.

Pyramidella (Oscilla) cingulata A. Ad. Ann. Mag. (3), VII, p. 296.

Takano-Shima (Ad.). Described as *Monoptygma*.

Pyramidella (Oscilla) annulata A. Ad. Man. Conch., VIII, p. 309, pl. 74, f. 28.

Mososeki, Yobuko (Ad.).

Pyramidella (Oscilla) sulcata Ad. Ann. Mag. N. H., 1860, p. 418.

Tsu-Shima, Nososeki (A. Ad.). Described as *Evalea*.

Pyramidella (Oscilla) lirata Ad. *l. c.* Sato, O-Shima Ad. Described as *Evalea*.

Pyramidella (Oscilla) circinata A. Ad. P. Z. S., 1867, p. 311.

O-Shima, Takano-Shima (Ad.).

Pyramidella (Orina) pyramidalis Ad. (*Syrnola*). P. Z. S., 1862, p. 233.

Tsu-Shima (Ad.).

Pyramidella (Elusa) subulata A. Ad. P. Z. S., 1862, p. 237; Man. Conch., VIII, p. 310, pl. 74, f. 30.

O-Shima, 26 fms, (Ad.).

Pyramidella (Elusa) castanea A. Ad. P. Z. S., 1862, p. 237,

O-Shima (Ad.).

Pyramidella (Elusa) cinnamomea A. Ad. P. Z. S., 1862, p. 237.

O-Shima (Ad.).

Pyramidella (Elusa) badia A. Ad. P. Z. S., 1862, p. 237.

Takano-Shima (Ad.).

Pyramidella (Elusa) gracilis A. Ad. P. Z. S., 1862, p. 237; Man. Conch., VIII, p. 310, pl. 74, f. 31.

Yobuko (Ad.).

Pyramidella (Elusa) strigulata A. Ad. P. Z. S., 1862, p. 237.

Yobuko (Ad.).

Pyramidella (Elusa) teres A. Ad.

Pyramidella (Chrysallida) plicata A. Ad. Ann. Mag. N. H., V, 1860, p. 478, 479; 1861, p. 44.

Mino-Shima, 63 fms., Goto, O-Shima (A. Ad.).

Pyramidella (Chrysallida) pupula, nana, terebra A. Ad. Ann. Mag. N. H. (3), VII, p. 44, 45.

Tsu-Shima 16–26 fms. (A. Ad.).

Pyramidella (Chrysallida) consobrina A. Ad. Ann. Mag. (3), VII, p. 44, 46.

Awa Shima, in shell sand, Goto (A. Ad.).

Pyramidella (Chrysallida) munda A. Ad. *t. c.*, p. 45. Corea Strait, 46 fms. (Ad.).

Pyramidella (Chrysallida) filocincta A. Ad. Journ. Linn. Soc., 1864, VII, p. 2.

O-Shima (Ad.).

Pyramidella (Chrysallida) rufolineata, galbula A. Ad. *Ibid*, p. 3. Goto, 48 fms. (Ad.).

Pyramidella (Chrysallida) erucella A. Ad. *Ibid*, p. 3. Seto-Uchi, O-Shima, Takano-Shima (Ad.).

Pyramidella (Chrysallida) consimilis A. Ad. Ann. Mag. 1861, p. 44.

O-Shima, Takano-Shima (A. Ad.).

Pyramidella (Chrysallida) alveata A. Ad. Ann. Mag. 1861, p. 45.

Tsu-Shima, 16–26 fms., Takano-Shima (Ad.).

Pyramidella (Chrysallida) mumia A. Ad. Ann. Mag. 1861, p. 45.

Goto, 48 fms. (Ad.).

Pyramidella (Chrysallida) mundula A. Ad. Ann. Mag. (3), VII, p. 42.

Sado Island, 30 fms., O-Shima (Ad.). Descr. as *Parthenia*.

Pyramidella (Mormula) rissoina A. Ad. Journ. Linn. Soc., VII, p. 1, 1863.

O-Shima, Takono-Shima (Ad.).

Pyramidella (Styloptygma) cerea A. Ad. P. Z. S., 1862, p. 236.

Takano-Shima (Ad.).

Pyramidella (Styloptygma) gibba A. Ad. P. Z. S., 1862, p. 236.

O-Shima, Tanabe (Ad.).

Pyramidella (Styloptygma) larvula A. Ad. P. Z. S., 1862, p. 236.

O-Shima (Ad.).

Pyramidella (Styloptygma) lendix A. Ad. P. Z. S., 1862, p. 236.

Yobuko (Ad.).

Pyramidella (Styloptygma) pupiformis A. Ad. P. Z. S., 1862, p. 235.

Mino-Shima (Ad.).

Pyramidella (Styloptygma) subuliformis A. Ad. P. Z. S., 1862, p. 236.

Tsu-Shima (Ad.).

Pyramidella (Styloptygma) taeniata A. Ad. P. Z. S., 1862, p. 235.

Takano-Shima (Ad.).

Pyramidella (Acteopyramis) eximia Lischke. Jap. M. C., III, p. 59, pl. 3, f. 4–6.

Yedo (Lischke); Kamakura (Stearns).

Pyramidella (Acteopyramis) cœlatum A. Ad. Ann. Mag., VII, 1861, p. 303.

Mino-Shima, 63 fms. (Ad.).

Pyramidella ("Monoptygma") acuminata Gld. Otia Conch., p. 150.

Oushima (Stimpson).

Pyramidella (Mumiola) reticosa A. Ad. Journ. Linn. Soc., VII, p. 5.

Seto-Uchi (Ad.).

Pyramidella (Mumiola) tessellata A. Ad. Journ. Linn. Soc., 1863, VII, p. 6.

Tanabe, O-Shima (Ad.).

Pyramidella (Mumiola) spirata A. Ad. Thes. Conch., pl. 172, f. 26, 27.

O-Shima (Ad.). Described as *Monoptygma*.

Odontostomia elata, japonica, nana, pygmæa, oblonga, secalina, tenera, hyalina A. Ad. Ann. Mag. (3), VII, p. 42.

Mino-Shima, 63 fms. (A. Ad.).

Odontostomia nivea, obesula, pupa, cana, ventricosa, goniostoma, vitrea A. Ad. Ann. Mag. (3), VI, p. 20, 21, 417.

Corea Strait and Mino-Shima, 63 fms. (Ad.).

Odontostomia subdiaphana, pruinosa A. Ad. *t. c.*, p. 417.

Okosiri, 35 fms. (Ad.).

Odontostomia subangulata, achatinella A. Ad. *t. c.*, p. 416, 417.

Tsu-Shima, 26 fms. (Ad.).

Odontostomia ovoidea A. Ad. *t. c.*, p. 416. Awa-Shima, at low water (Ad.).

Odontostomia lactea Dkr. Moll. Jap., p. 17, pl. 2, f. 4.

Deshima (Dkr.); Nagasaki (Lischke); Kamakura (Stearns).

Odontostomia fasciata Dkr. Moll. Jap., p. 17, pl. 2, f. 2.

Deshima (Dkr.); Nagasaki (Lischke).

Odontostomia neglecta Ad. Ann. Mag. (3), VI, p. 417.

Tabu-Shima, 25 fms. (Ad.).

Odontostomia (Evalea) elegans, pyramis, arcuata A. Ad. Ann. Mag. (3), VI, p. 22.

Mino-Shima, 63 fms. (Ad.).

Odontostomia (Evalea) sulcata A. Ad. Ann. Mag. (3), VI, p. 417.

Tsu-shima, 16 fms. (Ad.).

Odontostomia (Evalea) lirata Ad. *Ibid.* Tabu-Shima, Sado (Ad.).

Odontostomia (Auriculina) grayi, ovalis Ad. Ann. Mag. (3), VII, p. 42, 43.
Mino-Shima, 63 fms.

Odontostomia (Parthenia) spirata A. Ad. Mino-Shima (Ad.).

Odontostomia (Parthenia) costulata Dkr. Moll. Jap., p. 16, pl. 2, f. 15.
Deshima.

Odontostomia (Parthenia) foveolata A. Ad. Ann. Mag., 1860, V, p. 479.
Mino-Shima (Ad.).

Odontostomia (Parthenia) monocycla A. Ad. Ann. Mag., 1860, V, p. 479.
Mino-Shima, 63 fms., Goto, O-Shima, Tanabe (Ad.).

Odontostomia (Parthenia) costellata, littoralis A. Ad. Ann. Mag. N. H., 1861, (3), VII, p. 42.
Tsu-Shima, 26 fms. (Ad.).

Odontostomia (Parthenia) punctigera A. Ad. Ann. Mag., 1861, VII, p. 42.
Goto, Sado (A. Ad.).

Odontostomia (Parthenia) semiplicata A. Ad. Ann. Mag., 1860, V, p. 478. (*Chrysallida*).
Goto, O-Shima, Takano-Shima, Mino-Shima (A. Ad.).

Odontostomia (Parthenia) pusio. Ibid, (3), VII, p. 45. (*Chrysallida*).
Tsu-Shima, 16–26 fms., O-Shima (Ad.).

Odontostomia (Parthenia) pagodula A. Ad. Journ. Linn. Soc., VII, p. 4 (*Turbonilla monocycla* Ad. Ann. Mag., 1860, p. 418).
Mino-Shima, 63 fms., Taku-Shima, O-Shima (Ad).

Odontostomia (Parthenia) cælata A. Ad. Journ. Linn. Soc., VII, p. 4.
Seto-Uchi, Akasi, Tsu-Shima (Ad.).

Odontostomia (Pyrgulina) casta A. Ad. Ann. Mag., 1861.
Takano-Shima (Ad.). Described as *Chrysallida.*

Odontostomia (Pyrgulina) minna A. Ad. Ann. Mag., V, 1860, p. 478.
Mino-Shima, 63 fms, Goto (A. Ad.). Described as *Chrysallida.*

Odontostomia (Pyrgulina) brenda A. Ad. *Ibid.* Takano-Shima, O-Shima (Ad.). Described as *Chrysallida.*

Odontostomia (Pyrgulina) elegantula A. Ad. *Ibid.* Mino-Shima, 63 fms., Seto-Uchi (Ad.). Described as *Chrysallida.*

Odontostomia (Pyrgulina) pygmæa A. Ad. Ann. Mag., 1861.
Mino-Shima, 63 fms., Goto (Ad.). Described as *Chrysallida.*

Odontostomia (Pyrgulina) pulchella A. Ad. Ann. Mag., 1860.

Goto, Mino-Shima, Seto-Uchi, Akasi (Ad.). Described as *Chrysallida.*

Odontostomia (Pyrgulina) concinna A. Ad. Ann. Mag., 1860, p. 479.

Mino-Shima, 63 fms. (Ad.).

Odontostomia (Pyrgulina) miranda A. Ad. Ann. Mag., 1861.

Yobuko (Ad.). Described as *Chrysallida.*

Odontostomia (Pyrgulina) bellula A. Ad. Ann. Mag., 1861, p. 42.

Tabu-Shima, 24 fms. (Ad.). Described as *Parthenia.*

Odontostomia (Pyrgulina) fenestrata A. Ad. Ann. Mag., 1860, V. p. 479.

Mino-Shima, 63 fms. (Ad.). Described as *Parthenia.*

Odontostomia (Pyrgulina) pura A. Ad. Ann. Mag., (3), VII, p. 46.

Awa-Shima, in shell sand, Takano-Shima (Ad.). Described as *Chrysallida.*

Odontostomia (Pyrgulina) tantilla A. Ad. Journ. Linn. Soc., VII, p. 5.

O-Shima, Tanabe, Takano-Shima (A. Ad.).

Odontostomia (Pyrgulina) decussata A. Ad. *Ibid.* Goto, 48 fms. (Ad.).

Odontostomia (Miralda) diadema A. Ad. Ann. Mag., 1860, V, p. 479.

Mino-Shima, Seto-Uchi, Uraga (Ad.).

Odontostomia (Miralda) mariella A. Ad. *Ibid.* Mino-Shima, Goto, Tsu-Shima, Seto-Uchi (Ad.).

Odontostomia (Miralda) gemma A. Ad. Tsu-Shima, Seto-Uchi, Akasi (Ad.).

Eulimella philippiana Dkr. Moll. Jap., p. 17, p.. 2, f. 8.

Deshima (Dkr.); Kamakura (Stearns).

Eulimella opaca, pellucens A. Ad. Ann. Mag. (3), VII, 1861, p. 46, 47.

Mino-Shima, 63 fms. (Ad.).

Eulimella opalina, vitrea A. Ad. *Ibid.* Tsu-Shima, 26 fms. (Ad.).

Eulimella hyalina A. Ad. Ibid, p. 47.

Sado, 30 fms. (A. Ad.).

Eulimella (Stylopsis) typica A. Ad. Ann. Mag., V, 1860, p. 406.

Corea.

Eulimella (Stylopsis) sulcata A. Ad. Ann. Mag., VIII, 1861, p. 241.

Ochotsh Sea, 17 fms. (A. Ad.).

Eulimella (Stylopsis) rufofasciata E. A. Smith. Ann. Mag., 1875, p. 103, Vol. XVI.

E. of Yedo, 48 fath., sand and mud; a var. in Endermo Harb., 4 to 7 fath. (St. John).

Menestho exarata A. Ad. Ann. Mag., VIII, 1861, p. 303.

Hakodate Bay, 16 fms. (A. Ad.).

Menestho sculptilis A. Ad. Ibid. Mino-Shima, 63 fms. (Ad.).

Kleinella cancellaris A. Ad. Man. Conch., XV, p. 180; XVI, frontispiece, f. 6; Crossman, Essais de Paléoconch. Comparée, i, p. 44, f. 34.

Strait of Corea, 63 fms. (Ad.).

Kleinella sulcata A. Ad. Man. Conch., XV, p. 180.

Suwonado Sea, 7 fms. (Ad.).

Turbonilla fusca A. Ad. Man. Conch., VIII, p. 334, pl. 76, f. 46. Japan.

Turbonilla varicosa Dkr. Moll. Jap., p. 15, pl. 2, f. 5.

Deshima.

Turbonilla philippiana Dkr. Ibid, p. 16, pl. 1, f. 12.

Deshima.

Turbonilla multigyrata Dkr. Index, p. 79, pl. 13, f. 18–20.

Deshima.

Turbonilla perfecta, nitida, cincta, munda, speciosa, debilis, modica, metulina A. Ad. Ann. Mag., VI, 1860, p. 418–420.

Mino-Shima, 63 fms. (Ad.).

Turbonilla commoda, sculptilis, fragilis, bicincta A. Ad. *Ibid.* Tsu-Shima, 16 fms. (A. Ad.).

Turbonilla scaliola A. Ad. *Ibid.* Corea Strait, 46 fms.

Turbonilla (Cingulina) cingulata Dkr. Moll. Jap., p. 16, pl. 1, f. 10.

Deshima (Dkr.); Nagasaki (Lischke); Kamakura (Stearns).

Turbonilla (Cingulina) circinata A. Ad. Ann. Mag. N. H., 1860, p. 414.

Awa-Shima (Ad.).

Turbonilla (Dunkeria) craticulata A. Ad. Ann. Mag. (3), VII, p. 46.

Mino-Shima, 63 fms. (A. Ad.).

(*Rhipidoglossa.*)

NERITIDÆ.

Nerita polita Linné. Man. Conch., X, p. 30.

Tartary Strait (Schrenck).

Nerita albicilla L. Conchyl. Cab., p. 25, pl. 8, f. 1, 2, Man. Conch. X, p. 19.

Nagasaki (Lischke); Deshima (Nuhn); Inland Sea (Stearns.)

Nerita planospira Anton. Conchyl. Cab., p. 23, pl. 4, f. 4–7, Man. Conch., X, p. 21.

Japan (Martens).

Nerita pica Gld. Otia Conch., p. 108; Mart., Conchyl. Cab., p. 106, pl. 12, f. 15–18; Smith, Ann. Mag., 1875, Vol. XVI, p. 107; *N. japonica* Dkr., Moll. Jap., p. 18, pl. 2, f. 23.

Endermo (St. John); Simoda (Gld); Nagasaki (Lischke); Kishiu (Stearns).

Neritina sowerbiana Recl. Conchyl. Cab., p. 171, pl. 18, f. 1–4 and 10.

Hakodate.

Neritina retropicta Martens. Conchyl. Cab. p. 170, pl. 17, f. 18–20.

Japan (Siebold).

Neritina adspersa Recluz. Journ. de Conchyl., 1853, p. 319, pl. 7, f. 6.

Tokyo (Dkr.).

Neritina ualanensis Less. Conchyl. Cab., p. 193, pl. 20, f. 1–24.

Nagasaki.

Neritina crepidularia Lam. Man. Conch., X, p. 77.

Yokohama (Martens); Tokyo Bay (Stearns).

TURBINIDÆ.

Turbo marmoratus Linné. Man. Conch., X, p. 191, pl. 41, f. 23.

Nagasaki (Lischke); Sagami Bay (Stearns).

The animal of this Turbo is considered by the Japanese a great delicacy. It is first removed from the shell, cut into little squares like dice, replaced in the shell with a little soy, and cooked therein over a charcoal fire. (F. S.).

Turbo petholatus, Linné. Man. Conch., X, p. 193.

Inland Sea (Stearns).

Turbo petholatus var. **reevei** Phil. Man. Conch., X, p. 194, pl. 40, f. 15, 16.

Japan (Dkr., as *T. variabilis* Rve.).

Turbo (Senectus) argyrostomus var. **margaritaceus** Linné. Man. Conch., X, p. 198, pl. 45, f. 100.

Japan (Stearns).

Turbo (Senectus) parvulus Phil. Man. Conch., X, p. 206, pl. 44, f. 73, 74.

Japan (Stearns); Liu Kiu Is. (Phil.; Stearns).

Turbo (Batillus) cornutus Gmel. Man. Conch., X, p. 210, pl. 43, f. 50, 52.

Tokyo Harbor (young specimens lacking spines, Stearns); Yedo, Nagasaki (Lischke); Hakodate, etc., (Schrenck).

Turbo (Modelia) guttatus A. Adams. Man. Conch., X, p. 213, pl. 63, f. 39.

Tatiyama (Ad.).

Turbo (Marmorostoma) coronatus Gmel. Ann. Mag., 1875, Vol. XVI, p. 108.

Ooshima, on the shore (St. John); E. Coast Nippon (Stearns).

Turbo (Marmorostoma) granulatus Gmel. Man. Conch., X, p. 217, pl. 46, f. 18.

Nagasaki (Lischke).

Turbo (Marmorostoma) coreensis Recluz. Man. Conch., X, p. 217, pl. 47, f. 19.

Enoshima (Stearns). Usually regarded as an imperforate variety of the preceding.

Astralium (Cyclocantha) hæmatragus Mke. Man. Conch., X, p. 236, pl. 54, f. 57, 58.

Tokyo, Nagasaki, etc. (Dkr.).

A. rhodostoma Lam. (=*petrosum* Martyn) has been recorded by Dunker, but without exact locality. Its occurrence in Japanese waters is very doubtful.

Astralium (Cyclocantha) heimburgi Dkr. Index, p. 130, pl. 6, f. 6, 7.

Inland Sea of Japan (Dkr.).

Astralium (Guildfordia) triumphans Phil. Man. Conch., X, p. 228, pl. 58, f. 67, 68.

S.–E. coast Kii (Stearns).

Astralium (Bolma) modestum Rve. Man. Conch., X, p. 229, pl. 55, f. 63, 64.

Kii coast (Stearns); Nagasaki (Lischke).

Astralium (Pachypoma) japonicum Dkr. See Pilsbry, Proc. Acad. Nat. Sci., Phila., 1891, p. 473, pl. 19, f. 6–8 (operculum).

S.-E. coast Prov. Kii (Stearns); Kiushiu (Lischke).

Upon seeing the unique type specimen of *A. wardii* Baker (Proc. Rochester Acad. Sci., I, p. 136, pl. 11, f. 1) I considered it a depressed individual of this species. *A. japonicum* is not a *Pomaulax* as has been supposed, but a true *Pachypoma*, which is quite a different thing. Mr. Stearns' largest specimen measures 160 mm. diameter.

Leptothyra[1] **sangarensis** Schrenck. Amurl. Moll., II, p. 363, pl. 16, f. 6–11. (*Turbo*); Man. Conch., X, p. 250, pl. 64, f. 59.

Sangar Strait (Maximowicz); Bay of Hakodate (Albrecht and Lindholm).

[1] Synonyms of this generic name are as follows:—
Turbo Auct.

Collonia Auct non Gray.
Leptonyx and *Homalopoma* Cpr. (*præoc.*).
Cantrainea Jeffr.
Anadema Ads.
Petropoma Gabb. J. A. N. S., Phila., VIII, p. 281. See Nautilus, VII, p. 84.

L. sanguinea Linn. has erroneously been recorded from Japan and West America. It is Mediterranean.

Leptothyra amussitata Gld. Man. Conch., X, p. 250, pl. 55, f. 71, 72; Ann. Mag., 1875, Vol. XVI, p. 109.

Endermo, 4–7 fathoms; a variety from Yamado, 7 fathoms, sand (St. John).

Leptothyra purpurascens Dkr. Index, p. 129, pl. 12, f. 1–3.

Japan (Dkr.).

Leptothyra rubra Dkr. Ind. Moll. Mar. Jap., p. 128, pl. 12, f. 7–9.

Japan (Dkr.).

Leptothyra transenna Watson. Challenger Gastrop. XV, p. 125, pl. VI, f. 12.

Japan 565 fathoms.

Leptothyra pilula Dkr. Moll. Jap., p. 19, pl. 3, f. 7. (*Liotia*). *Cynisca japonica* Ad. is a synonym.

Corea Strait (Ad.).

Leptothyra nocturna Gld. Otia Conch., p. 160; Ann. Mag., 1875, XVI, p. 109.

Simoda (Stimpson); Lat. 41° 12′ N., Long. 140° 45′ E., 43 fath., sand and mud; variety from Yamada Harbor (St. John).

PHASIANELLIDÆ.

Phasianella megastoma n. sp. Pl. VIII, fig. 9.

Shell imperforate, in shape like *Ph.* (*Chromotis*) *neritina* but the spire longer and more pointed. Surface smooth, hardly shining; either dotted closely and evenly all over with red on a pale buffish ground, or having several spiral girdles of white spots, and a subsutural series of white flames; the apex yellow or whitish. Whorls 3½, very rapidly increasing, the last expanding toward the aperture. Aperture round-oval, very large, oblique; columella and parietal wall regularly arcuate, with a moderate deposit of callus. Operculum white outside. Alt. 3·2, diam. 2·9 mill.

Nemoto, Boshiu (Fr. Stearns).

The extremely large aperture sufficiently characterizes this species.

Phasianella oligomphala n. sp. Pl. VIII, fig. 8.

Shell ovate-turrited, smooth, hardly shining, perforated. Dotted in spiral order with red on a pale ground, often having in addition some girdles of white spots, and very oblique snow-white stripes descending from the suture. Whorls 4½, well rounded, the sutures deep, the apex subacute. Aperture round-ovate, about half the shell's length; inner lip separated from the body by a long, narrow umbilical fissure, which is much reduced in some shells. Operculum white outside. Alt. 4·35, diam. 2·8 mm.

Nemoto and Tokyo Harbor (Stearns).

The color patterns of this little *Tricolia* are similar to those of the preceding species, but it is far slenderer than that, and perforated.

Phasianella (Orthomesus) modesta Gld. Pl. VI, figs. 29, 30.
Pils., Man. Conch., X, p. 183.

Loo Choo (Stimp.); Nemoto (Stearns); N. shore Prov. Tango (Gaines).

It is not without some doubt that I identify these shells with Gould's unfigured species, but they agree with his short description as far as that goes.

P. modesta gouldii n. var. Pl. VI, fig. 31.

Shell the shape of *P. kochii* Phil., clear red, showing under the lens dense microscopic redder spiral lines and toward the base some spaced red spirals with remote, white specks. Marked above the periphery with a few bold oblique stripes of snow-white; a subsutural band mottled with blackish.

This form occurs with the preceding, of which I consider it a variety. It is probably what Dunker lists as *P. capensis*.

Dunker (Index, p. 127) reports *Phasianella variegata*, *P. elongata* and *P. capensis* from Japan, the last on Schrenck's authority. The first of these was perhaps *Phasianella* (*Orthomesus*) *modesta*. The other two were incorrect identifications. The S. African species named are of the group of *P. pulla*, while the above Japanese forms belong to *Orthomesus*, as is shown by their spaced capillary lines.

DELPHINULIDÆ.

Delphinula delphinula Linn. *D. laciniata* Lam., Man. Conch., X, p. 266.

Japan (Stearns, No. 1,127); Nagasaki (Lischke, *D. atrata*).

Several specimens of the typical form, and var. *atrata* Rve.

Delphinula distorta Linné. Inland Sea (Stearns).

Liotia semiclathratula Schrenck. Amurl. Moll., II, p. 370, pl. 16, f. 16–25; Ann. Mag., 1875, XVI, p. 110.

Toba Harbor, 9 fms., sand (var. St. John); Sangar Strait (Schrenck); N. shore of Tango (Gaines).

Liotia dædala A. Ad. P. Z. S., 1863, p. 72. Goto; Oshima (Ad.).

Liotia tantilla A. Ad. P. Z. S., 1863, p. 72. Goto Is., 71 fms. (Ad.)

Liotia armata A. Ad. Ann. Mag., Sept., 1861, p. 243.

Corea Strait (Ad.).

TROCHIDÆ.

Trochus niloticus Linné. Man. Conch., XI, p. 17. Nagasaki (Lischke).

Trochus turris Philippi. *T. altus* Phil., Conchyl. Cab., p. 217, pl. 32, f. 7, not *T. altus* Perry, 1811. *T. turris* Phil., Zeitsch. f. Mal., 1846, p. 102.

Inland Sea (Dkr.).

Dunker reports *T.* (*Cardinalia*) *virgatus* Gmel. also from Japan, without more accurate locality. Its occurrence there is doubtful.

Trochus (**Tectus**) **obeliscus** Gmel. Man. Conch., XI, p. 19, pl. 2, f. 13, 14.

Deshima (Nuhn); Nagasaki (Lischke).

Trochus (**Lamprostoma**) **rubricatus** Philippi. Phil., Conch., p. 213, pl. 31, f. 13; Pilsbry, Man. Conch., XI, 32.

Japanese Seas (Fischer); Japan (Stearns).

This and the next two species are closely allied.

Trochus (**Lamprostoma**) **sacellum** Philippi. (*T. spengleri* Gmel.). Phil., Conch. Cab., p. 309, pl. 44, f. 13; Pilsbry, Man. Conch., XI, 34; *T. spengleri* Gmel.; Lischke, J. M. C., p. 93.

Nagasaki (Lischke).

Trochus (**Lamprostoma**) **rota** Dunker. Dkr., Moll. Jap,, p. 21, pl. 3, f. 4; Lischke, Jap. Meeres-Conch., p. 94, pl. 6, f. 20, 21; Pils., Man. Conch., XI, p. 35 *Polydonta gloriosum* Gld., Otia, p. 158.

Nagasaki (Lischke); Deshima (Nuhn, Dkr.); Ooshima (St. John).

Without exact locality, Dunker reports *T. maculatus* from Japan. This reference needs confirmation. Three specimens of *T. incrassatus* were brought by Stearns, but it too was perhaps not native.

Trochus (**Infundibulum**) **chloromphalus** A. Adams. Lischke, Jap. Meeres-Conch., p. 92, pl. 6, f. 17, 18. Pils., Man. Conch., XI, p. 38.

Nagasaki (Lischke).

Trochus (**Lamprostoma**) **squarrosa** Lam. Man. Conch., XI, p. 32, pl. 6, f. 60, 61.

Nagasaki (Lischke, J. M. C., I, p. 92).

Clanculus margaritarius Phil. Phil., Conch. Cab., p. 74, pl. 14, f. 4; Dkr., Index, p. 139.

Japan (Van Nostrand). The *Clanculus smithii* Gray (=? *C. undatus* Lm.), reported from Japan by A. Adams (before he had been there), may hardly be admitted without several grains of salt.

Clanculus microdon A. Ad. Man. Conch., XI, p. 78.

North shore of Tango (Gaines).

Monodonta labio Linné. Pilsbry, Man. Conch., XI, p. 86, pl. 19, f. 95, 96; Lischke, J. M. C., I, p. 95.

Nagasaki (Lischke); Deshima (Nuhn, Dkr.); Hakodate (Schrenck); Ooshima (Chall.); Seta coast (Stearns).

Dunker reports *M. australis* also, but without exact locality.

Monodonta neritoides Philippi. Phil., Conch. Cab., p. 303, pl. 44, f. 4; Pilsbry, Manual XI, p. 106; Proc. Acad. Nat. Sci., Phila.

Southeast Kii coast (Stearns); Yokohama (Martens).

Monodonta neritoides var. **perplexa** Pils. Pils., Man. Conch., XI, p. 107, pl. 35, f. 6–8.

Japan.

Monodonta (Oxystele) suavis Philippi. Pils., Man. Conch., XI, p. 117, pl. 23, f. 71–75; *O. kœneni* Dkr., Index, p. 142, pl. 12, f. 4–6.

Japan (Dkr., Stearns).

Chrysostoma paradoxum Born. Man. Conch., XI, p. 466.

Mr. Stearns' specimen of this (No. 1186) may not be really Japanese, although it was procured in Japan.

Chlorostoma argyrostoma Gmel. Lischke, Jap. Meeres-Conch., I, p. 96, pl. 7, f. 4; Pilsbry, Manual, p. 165.

It is very doubtful whether this species occurs in Japanese waters. The large example figured by Lischke, as well as the extensive suite in the collection of the Academy, are from China. Lischke calls the typical form of *argyrostomum* "var. *major*," but this term is superfluous.

Chlorostoma umbilicatum Lischke. Pl. VI, figs. 11, 12.

Lischke, Jap. Meeres-Conch., I, pl. 7, f. 5; II, p. 87 ("*C. argyrostomum v. umbilicatum*").

Nagasaki (Lischke). More strongly spirally lirate beneath than *C. argyrostomum*, and umbilicate. The specimen figured is in the collection of Mr. Shelly G. Crump, of Rochester, N. Y.

Chlorostoma distinguendum Dkr. Dkr., Moll. Jap., p. 22, pl. 3, f. 1.

Deshima (Dkr.); Japan (Stearns).

Chlorostoma turbinatum A. Adams. Pl. VI, figs. 9, 10.

Pils., Man. Conch., XI, p. 193, 194. *Ch. rugatum* Gld., Otia, p. 158, *fide* E. A. Smith.

Toba, S. Niphon (Smith); Hakodate Bay and Simoda (Stimp).; Hakodate (Stearns).

Shell having the contour of *argyrostomum* but much smaller, the oblique folds of the upper surface coarser, not splitting below the sutures, often crossed by some indistinct spirals; base slightly convex, with five or six spiral cords, often subobsolete; columella as in argyrostomum, the umbilical region closed in both old and young, but with a deep pit, encircled on the side toward the mouth by a green callus; the outer margins of the umbilical tract more or less stained with golden. Color above and below, black, in both young and old examples. Alt. 21, diam. 25 mm. The species has not hitherto been figured.

Chlorostoma nigerrimum Gmelin. Lischke, J. M. C., p. 79, pl. 7, f. 6, 7; Pilsbry, Manual XI, p. 165. *Ch. corrugatum* A. Ad.; *Ch. undatella* Gld.

Nagasaki (Lischke); Deshima (Nuhn, Dkr.); Oushima, Kagoshima and Taneogoshima (Stimpson; *C. undatella* Gld., Otia, p. 158).

Chlorostoma xanthostigma A. Adams. (*nigricolor* Dkr.). Dkr., Moll. Jap., p. 22, pl. 3, f. 2; Lischke, J. M. C., p. 100, pl. 7, f. 1, 2.

Nagasaki (Lischke); Deshima (Nuhn, Dkr.); Ooshima (St. John).

Chlorostoma lischkei Pilsbry. Pilsbry, Man. Conch., XI, p. 167, pl. 26, f. 16.

Japan (A. Garrett).

Chlorostoma rusticum Gmelin. Pilsbry, Man. Conch., XI, p. 166, pl. 25, f. 1–4; Lischke, J. M. C., p. 97.

Nagasaki (Lischke); Deshima (Nuhn, Dkr.); Hakodate (Schrenck and Stearns).

The upper surface is very strongly rudely ribbed throughout, the ribs extending slightly over the periphery upon the base. Color, black above, black and white strigate beneath, the young black beneath. In the typical *rusticum* the ribs are less strong.

Chlorostoma brunneum Phil. Pilsbry, Man. Conch., XI, p. 170, pl. 27, f. 36–38.

Nagasaki (Lischke).

A single large specimen (alt. 39, diam. 33 mm.) collected by Stearns, which is undoubtedly this species.

Chlorostoma carpenteri Dunker. Lischke, Jap. Meeres-Conch., p. 98, pl. 7, f. 8, 9, 10; Pils., Man. Conch., XI, p. 168.

Nagasaki and Deshima (Lischke); Southeast coast, Prov. Kii (Stearns).

Chlorostoma pfeifferi Philippi. Pilsbry, Man. Conch., XI, p. 167, pl. 26, f. 13–15. *T. nordmanni* Schrenck, *Ch. achates* Gld.

Yedo (Lischke); Hakodate (Schrenck); Simoda (N. P. E. E.); S.-E. coast Kii (Stearns).

Chlorostoma sordidum Philippi. Phil., Conch. Cab., p. 301, pl. 44, f. 1. *T. subfuscescens* Schrenck, *vide* Pilsbry, Man. Conch., XI, p. 188, 189.

Bay of Hakodate (Schrenck); Tokyo Harbor (Stearns); Ooshima and Endermo (St. John).

Cantharidus (Thalotia) japonicus A. Adams. Pilsbry, Man. Conch., XI, p. 355, pl. 17, f. 25.

Nagasaki, Yokohama, Tokyo Harbor, Inland Sea, Nemoto, Boshiu (Stearns); N. shore of Tango (Gaines).

A series of many hundred examples was collected, exhibiting a very wide range of variation in color. We consider *Cantharidus hilaris* Lischke (Jap. Meeres-Conch., II, p. 85, pl. 5, f. 14, 15, and Fischer, Coq. Viv. Trochus, p. 353, pl. 110, f. 2) from Nagasaki, a synonym.

Cantharidus (Thalotia) yokohamensis Bock. Bock, P. Z. S., 1878, p. 727, pl. 46, f. 3; Pilsbry, Manual XI, p. 147, pl. 40, f. 40.

Yokohama (Bock).

Alcyna ocellata A. Ad. Man. Conch., X, p. 182, pl. 40, fig. 12.

Tatagama; Nemoto, Boshiu (Stearns); off Talen-Shima, 25 fms. (Ad.)

Alcyna lepida A. Ad. Man. Conch., X, p. 182.

Off Talen-Shima, 25 fms. (A. Ad.).

Gibbula globularia Schrenck. Schrenck, Amurl. Moll., p. 357, pl. 16, f. 1–4; Pilsbry, Man. XI, p. 226, pl. 57, f. 10.

Bay of Hakodate (Schrenck).

Gibbula corallina Smith. Smith, Ann. Mag., 1875, XVI, p. 111; Pilsbry, Manual XI, p. 225.

Gibbula yamadana Smith. Smith, Ann. Mag., 1875, XVI, p. 111; Pilsbry, Manual XI, p. 224.

Yamada Harbor (St. John).

Gibbula japonica Smith. Smith, Ann. Mag. N. H., 1875, XVI, p. 110; Pilsbry, Man. Conch., XI, p. 224.

Gulf of Yedo, lat. 35° 35′, long. 139° 48′, in 6–25 fms. (St. John).

Gibbula redimita Gld. Pilsbry, Man. Conch., XI, p. 227; Smith, Ann. Mag. Nat. Hist., 1875, XVI, p. 111.

Bay of Hakodate (Stimpson); lat. 41° 12′ N., long. 140° 45′ E., 43 fath. (St. John).

Gibbula ochotensis (Midd.) Phil. Man. Conch., XI, p. 237, pl. 60, f. 3, 4.

Okhotsk Sea.

Gibbula eucosmia n. sp. Pl. VIII, fig. 4,

Shell umbilicate, conic and elevated, with flattish base. Coral-red with a series of white flammules below the sutures and white spots at periphery, but sometimes the flames extend to periphery; base red with an umbilical white patch. Surface sculptured with raised smooth, spiral cords, of which there are 6 above the periphery rather widely spaced, and on the base 10 much closer; between the cords very delicate growth lines are visible. Whorls about 6½, convex, the last one subangular at periphery. Aperture rounded, columella concave above, straightened below, bluntly angled at base. Umbilicus narrow, rather funnel-shaped at the opening. Alt. 7, diam. 6 mm.

Hizen (Stearns); N. shore of Prov. Tango (Gaines).

Gibbula? fulgens Gld. Pilsbry, Man. Conch., XI, p. 225; pl. 40, f. 38; Smith, Ann. Mag., 1875, XVI, p. 110; Syn.: *T. iridescens* Schrenck.

Off Cape Blunt, 35 fms. (St. John).

Gibbula (Cantharidella) callichroa Philippi. Phil., Conch. Cab., p. 298, pl. 43, f. 15. *Trochus jessoensis* Schrenck, Moll. Amur-landes, etc., p. 353, pl. 15, f. 11–18; Pilsbry, Man. Conch., XI, p. 222.

Hakodate (Schrenck); Hizen (Stearns); N. shore of Prov. Tango (Gaines).

Enida japonica A. Adams. Dkr., Index, p. 144, pl. 12, f. 17, 18. Pils., Man. Conch., XI, p. 245, pl. 67, figs. 44, 45.

Off Mino-Shima, 63 fms. (Ad.).

Enida speciosa A. Adams. Pils., Man. Conch., XI, p. 245.

Off Mino-Shima, 63 fms. (Ad.).

Enida gemmulosa A. Adams. Pils., Man. Conch., XI, p. 246.

Off Mino-Shima, 63 fms. (Ad.).

Basilissa lampra Watson. Challenger Gastrop., p. 97, pl. 7, f. 5.

Mid-Pacific, E. of Japan, 2050 fathoms (Chall.).

Monilea inepta Gld. Otia Conch., p. 155; Pils., Man. Conch., XI, p. 254.

Kagoshima Bay (Stimpson).

Monilea vernicosa Gld. Pilsbry, Man. of Conch., XI, p. 254; Otia, p. 155.

Ooshima (Stimpson).

Monilea glareosa Gould. Pils., Man. Conch., XI, p. 255; Otia, p. 155.

Loo Choo, Oushima and Kikaia (Stimp.). This may be a *Solariella* or *Minolia*.

Monilea smithi Dunker. Pilsbry, Man. of Conch., XI, p. 438, pl. 38, f. 5–7; Dkr., Index, pl. 6, f. 16–19 (*Euchelus*).

Wakayama (Dkr.).

Monilea (Rossiteria) nuclea Philippi. Pilsbry, Man. Conch., XI, p. 257, pl. 61, f. 31, 32.

Japan (Fischer); Viti Is. (Garrett! in coll. Phila. Acad.).

Bathybembix argenteonitens Lischke. Lischke, Jap. Meeres-Conch., III, p. 66, pl. 4, f. 1; Pilsbry, Manual XI, p. 347.

Yedo (Lischke); Inland Sea (Stearns).

This species varies but little. A larger individual measures, alt. 48, diam. 35 mm. In Japan it is called *Ginkai*, silver shell.

Bathybembix crumpii Pilsbry. Pl. XI, fig. 4.
Pilsbry, Nautilus, VI, p. 105, 133, pl. 2, f. 3.

Japan (Shelly G. Crump).

Bathybembix æola Watson. Wats., Chall. Gast., p. 95, pl. 7, f. 13; Pilsbry, Manual, p. 163, pl. 40, f. 10, 11.

Off Enoshima, Japan, in 565 fms. (Challenger Exped.).

Bathybembix abyssorum E. A. Smith. P. Z. S., 1891, p. 438, pl. XXXIV, f. 5.

North Pacific, E. of Japan in 2300 fathoms (Challenger).

Minolia[1] **punctata** A. Adams. Pilsbry, Man. Conch., XI, p. 259, pl. 44, f. 33.

Mino-Shima (A. Ad.).

[1] *Minosia* Dkr., Index, p. 142.

Minolia pulcherrima (A. Ad.) Sowb. Sowerby, Conch. Icon., XX, *Margarita*, f. 11.

Japan (Sowb.).

Seems to be a synonym of *M. punctata* A. Ad., and the name is preoccupied.

Minolia mustelina Gould. Gld., Otia, p. 154. (*Margarita*).

Hakodate Bay, low water (N. P. E. E.).

Minolia vitiliginea Mke. (?). Lischke, Jap. Meeres-Conch., II, p. 86.

The type of this species as figured by Philippi (Conch. Cab. Trochus, p. 176, pl. 28, fig. 2) is unlike any Japanese specimens I have seen.

Minolia Stearnsii n. sp.

Shell more depressed than *M. vitiliginea* Mke., thin, shining, widely umbilicate; densely and finely radially vermiculate with olivaceous on a pale ground above, usually with few or many radial dark clouds below the suture, and several narrow articulated, spaced spiral lines, the periphery lighter, often spotted; base with paler vermiculate and articulated pattern. Surface closely and evenly sculptured with spiral striæ throughout, with inconspicuous rather spaced oblique impressed lines, and between them very faint, close growth-striæ which slightly crenulate the spirals. Whorls 5, very convex, rather flattened below the sutures, producing a blunt median angle on the whorls of the spire. Last whorl subangular at periphery and around umbilicus; the latter funnel-shaped, one-fourth the total diameter of the shell, white within and with distinct growth-lines. Aperture roundly subquadrate, oblique; columella slightly dilated above, straight in the middle, bluntly angular at base. Alt. 6·2, diam. 10 mm.; *var.:* olivaceous replaced by brilliant rose color.

Nemoto, Boshiu (Stearns). I separate this from the *vitiliginea* of Menke (see Philippi) on account of its more depressed form and wider umbilicus.

Margarita helicina Fabr. Man. Conch., XI, p. 285; *M. arctica* Leach, Dkr., Index, p. 145.

Has been reported from northern Japan.

Turcica imperialis A. Adams. Lischke, Jap. Meeres-Conch., III, p. 67, pl. 4, f. 4–6; Pilsbry, Man., p. 415. *T. adamsianus* Schrenck.

Tsusaki, W. coast of Japan, 37 fms. (Ad.); Bay of Yedo (Lischke); Hakodate (Schrenck); Japan (Stearns).

The largest specimen measures, alt. 38, diam. 31 mm. The color varies from uniform cream-white, to brownish, maculated and lightning-streaked with reddish-brown. One specimen has the beaded cords of the upper surface reduced to fine, subobsolete, almost smooth threads, the periphery with a double series of compressed beads, and another similar cingulus below the suture. This specimen contrasts strongly with the typical form, but we can only regard it as a variety.

Turcica concinna A. Adams. Pilsbry, Man. Conch., XI, p. 415.

Uraga, Japan (Ad.).

T. coreensis Pease.

Corea Sea. This is hardly Japanese. The "*T. instricta*" reported from Satanomosaki by A. Ad. (Ann. Mag. N. H. (3), XIII, p. 143) can hardly be the real *Euchelus instrictus* Gld., of which specimens are before me from New Caledonia and Viti Is. (see Man. Conch., XI, p. 440).

Calliostoma unicum Dunker. Pilsbry, Man. of Conch., XI, p. 341, pl. 16, f. 9, 10; Lischke, J. M. C., III, p. 64. *C. affinis* Dall.

Nagasaki (Lischke); Deshima (Nuhn! Dkr.); Simoda (Dall); Inland Sea and Tokyo Harbor (Stearns).

About 200 hundred specimens found by Mr. Stearns. They agree in sculpture, but vary from reddish to yellow in ground color, and on some the broad cloud-like dark maculæ of the upper surface are wanting.

Calliostoma consors Lischke. Lischke, Jap. Meeres-Conch., I, p. 65, pl. 4, f. 2, 3; Pilsbry, Man., XI, p. 347.

Bay of Yedo (Lischke); Inland Sea (Stearns).

This seems to be merely a variety of *C. unicum*.

Calliostoma sowerbyi Pilsbry. Pilsbry, Man. of Conch., XI, p. 34, pl. 18, f. 17; *Ziziphinus jucundus* Sowb. not Gld.

Japan (Sowb., Stearns).

Calliostoma hungerfordi Sowerby. P. Z. S., 1888, p. 568, pl. 28, f. 14; Pilsbry, Man. of Conch., XI, p. 343, pl. 34, f. 11.

Japan (Hungerford).

Calliostoma urbanum Gould. Otia, p. 157; Pils., Man. Conch., XI, p. 401.

Kagoshima Bay (Stimp.).

Calliostoma infuscatum Gould. Gld., Otia, p. 157; Pilsbry, Man. Conch., XI, p. 401.

Kagoshima Bay (N. P. E. E.).

One of the original lot is in the collection of the Academy of Natural Sciences of Philadelphia, showing it to be a well marked species. It will probably occur larger in size.

Calliostoma (Lischkeia) moniliferum Lam. Encycl. Meth., pl. 445, f. 2; Pils., Man. Conch., p. 347; *Tr. alwinæ* Lischke, Jap. Meeres-Conch., II, p. 84, pl. 6, f. 17–19.

Kiusiu I. (Lischke); Japan (Stearns).

Euchelus bronni Dunker. Dkr., Moll. Jap., p. 22, pl. 3, f. 8; Pils., Man. Conch., XI, p. 438.

Japan (Dkr.).

Euchelus pauperculus Lischke. Lischke, Jap. Meeres-Conch., III, p. 69, pl. 4, f. 9–11; Pilsbry, Man. Conch., XI, p. 439, pl. 63, f. 20, 21.

Yedo (Lischke); Tokyo Harbor (Stearns).

Euchelus exiguus A. Adams. Pils., Man. Conch., XI, p. 118; *Monodonta exigua* A. Ad., P. Z. S., 1856, p. 176.

Japan (Siebold).

Euchelus ruber A. Adams. Man. Conch., XI, p. 440, pl. 67, f. 79.

Kamakura (Stearns). Specimens of clear, pale brown tint, with light brown scattered dots, but agreeing quite perfectly with typical *rubra* in sculpture. Also, N. shore of Tango (Gaines), a red specimen.

Ethalia rufula Gould. Gld., Otia, p. 154.

Ooshima (N. P. E. E.).

This genus is here understood in the sense explained in Man. Conch., XI, p. 457, not as used by authors generally. The *Umbonium anguliferum* Phil., reported from Yokohama by Dunker, must be a mistake, as that is a New Zealand species of *Ethalia*.

Umbonella murrea Reeve. Rve., Conch. Icon., *Turbo*, f. 54; Ad., Ann. Mag. N. H. (3), XI, p. 265, 1863, *Isander maculosus* A. Ad.

Goto Is., 71 fms. (Ad.).

Camitia sp.

See Man. Conch., XI, p. 465. No good authority for the Japanese reference seems to exist.

Umbonium giganteum Lesson. Pilsbry, Man. Conch., p. 454, pl. 58, f. 17–19.

Kii coast (Stearns); Yedo, Nagasaki (Lischke).

The following principal color patterns occur:

(1). Entire surface uniform blue-black.

(2). Olivaceous, with short black and cream blotches below the suture, a continuous red band at periphery, bordered below by a white band.

(3). Olivaceous-yellow, yellow, or pinkish-yellow, unicolored or marked like the preceding.

(4). Very light drab, almost white, uniform or marked like number 2.

(5) Plumbeous, with a series of black and cream blotches below the suture, and a series of cream and dark plumbeous maculæ at the periphery.

Many specimens, especially immature ones, show a group of several spiral striæ immediately above the periphery.

Umbonium costatum Lesson. Pils., Man. Conch., XI, p. 54, pl. 59, f. 34, 35.

Kii coast (Stearns); Simoda, Hakodate, Tsu-Shima, etc. (Ad.); Nagasaki (Lischke).

Very large specimens, measuring alt. 22, diam. 30 mm. The coloration is very uniform, consisting of narrow radial stripes of buff and olive-bluish broken into a fine tessellation by the spiral grooves of the upper surface, the base with coarser radial stripes, sometimes interrupted; umbilical callus purplish-pink.

Umbonium costatum var. **superbum** Gould. Lischke, J. M. C., II, p. 83, pl. 5, f. 18–21.

Nagasaki (Lischke); Kagoshima (N. P. E. E.); Inland Sea, Hizen, near Enoshima (Stearns).

Very extensive suites of this form were collected by Mr. Stearns; and a critical examination shows that there is really no character whatever separating them from *U. costatum* except size. The subsutural fasciole is sometimes smooth, but more often more or less tuberculate; and specimens occur which are very different to distinguish from *U. moniliferum*. Mr. Stearns has assorted the forms into numerous color varieties which he designates by letters. The more notable of these are as follows:

(1). Coloration as described above for *U. costatum*, the stripes above continuous or tessellated, periphery often with a white and a red girdle, (Nagasaki, Kii). (See Lischke, II, pl. V, f. 20, 21).

(2). Same pattern as above, but ground color orange, stripes faint olive; base without stripes, red or yellow.

(3). Same as No. 1, but with wide blotch-like stripes at and below the periphery. (See Lischke, f. 18, 19).

(4). Entire surface blue-black or purple-black, callus fleshy. (Hizen).

(5). Ground color and subperipheral fasciole red, stripes close and dusky; interstices between spiral cords pure white. This is the most remarkable and lovely pattern. The base is articulated, broadly striped or uniform.

(6). Ground color almost white; stripes or tesellation very pale bluish or brown; callus white or fleshy. (Inland Sea).

(7). Stripes broad and red, on a yellow ground.

(8). Upper surface with broad white zone. One specimen of this variety lacks spiral sulci, and has very convex whorls.

Umbonium japonicum Sulliotti. Pilsbry, Man. Conch., XI, p. 456.

Sea of Japan (Sul.).

Will prove a synonym of *U. moniliferum* or *superbum*. Sowerby (Thes., V, p. 472) reports *U. suturalis* Lam. from Japan; and A. Adams reports *vestiarium* Linn.

Umbonium moniliferum Lamarck. Pilsbry, Man. Conch., XI, p. 456, pl. 58, f. 22–31.

Kishiu, Kamakura (Stearns); Nagasaki, Simoda, O-Shima (Dkr.).

Three color varieties collected:

(1). White, with some faint or obsolete tessellation; callus white or light. (Kishiu).

(2). Yellow, with light olive tessellation; callus pink or dusky.

(3). Ground color buff or white, with wide red stripes, sometimes reducing the light ground to mere spots; base with broad oblique stripes, or a subperipheral red girdle. (Kamakura).

Umbonium thomasi Crosse. Pilsbry, Man. Conch., XI, p. 453, pl. 57, f. 31, 32. *Rotella infraplanata* Sowerby.

Hakodate.

Umbonium adamsi Dunker. Dkr., Index, p. 135, pl. 6, f. 3–5.

Japan (Dkr.). Is this more than a variety of *U. thomasi?*

CYCLOSTREMATIDÆ.

Cyclostrema anaglyptum A. Ad. Man. Conch., Vol. X, p. 88, pl. 31, f. 15, 16.

Seto-Uchi (Adams).

Cyclostrema pulchella Dkr. Moll. Jap., p. 20, pl. 3, f. 5.

Tokyo (Stearns); Bay of Yedo (Lischke); Inland Sea (A. Ad.). Tryon unites this with *C. micans* A. Ad.

Cyclostrema ammonoceras A. Ad. Man. Conch., Vol. X, p. 89, pl. 31, f. 34, 35.

Japan (Adams).

Cyclostrema dunkeri Tryon. Man. Conch., X, p. 91, pl. 32, f. 48, 49. *C. cingulatum* Dkr. not Phil.; Moll. Jap., p. 20, pl. 3, f. 11.

Deshima (Dkr.); Tokyo Harbor (Stearns).

Cyclostrema biporcatum A. Ad. Conch. Icon., Vol. 19, pl. 1, f. 7 a, b.

Seto-Uchi (Adams).

Cyclostrema lævis Keiner. Sp. et Icon. Coq. Viv., *Delphinula*, pl. 4. f. 6.

Japan.

C. duplicata Lischke. Jap. Meeres-Conch., III, p. 61, pl. 3, f. 9.

Yedo (Lischke).

Cyclostrema cinguliferum A. Ad. Conch. Icon., Vol. 19, pl. 1, f. 1 a, b.
Japan (Adams).

Cyclostrema tornatum A. Ad. Conch. Icon., Vol. 19, pl. 2 f. 15.
Japan (Adams).

Cyclostrema sulcatum A. Ad. Conch. Icon., Vol. 19, pl. 2, f. 3.
Japan (Adams).

Cyclostrema (Tubiola) cornuellum A. Ad. Conch. Icon., Vol. 19, pl. 3, f. 21 a. b.
Japan (Adams).

Cyclostrema (Tubiola) nivea A. Ad. Man. Conch., Vol. X, p. 96, pl. 33, f. 89, 90.
Japan (Chem.).

Cyclostrema (Daronia) cyclotina A. Ad. Conch. Icon., Vol. 19, pl. 3, f. 20 a, b.
Japan (Ad.).

Cyclostrema (Morchia) obvolutum A. Ad. Conch. Icon., Vol. 19, pl. 3, f. 19 a, b.
Japan (A. Ad.).

Teinostoma concentricum A. Ad. Conch. Icon., Vol. 19, pl. 1, f. 2 a, b.
Takano-Shima (Adams).

Teinostoma radiatum A. Ad. Conch. Icon., Vol. 19, pl. 1, f. 6 a, b.
Kino-o-Shima (Adams).

Teinostoma lucidum A. Ad. Conch. Icon., pl. 1, f. 7 a, b, Vol. 19.
Japan (Adams).

Teinostoma (Calceolina) pusillum (C. B. Ad.). A. Ad. Conch. Icon., Vol. 19, pl. 1, f. 8 a, b.
Japan (Adams).

Teinostoma candidum A. Adams. Ad., Ann. Mag. N. H., 1862, p. 296 (Ethalia); Sowerby, Conch. Icon., XX, pl. 4, f. 14 (*Rotella*).
Goto Is., 71 fms. (Ad.).

Teinostoma polita A. Adams. Ad., l. c.; Sowb,. l. c., f. 17 (*Rotella*).
Goto Is., 71 fms. (Ad.).

Teinostoma omphalotropis A. Adams. Ad., Ann. Mag. N. H., 1863, XI, p. 266 (Ethalia).
Yobuko, 17 fms. (Ad.).

Teinostoma nitida A. Adams. Ad., Ann. Mag. N. H., p. 266 (Ethalia).
Yobuko, 14 fms. (Ad.).

Teinostoma sobrina A. Adams. Ad., Ann. Mag. N. H., 1861, VIII, p. 306; XI, p. 266 (Ethalia); Sowerby, Conch. Icon., Vol. 19, pl. 2, f. 19.

Kino-o Shima, Takano-Shima, 25 fms. (Ad.).

Teinostoma perspicua A. Ad. Ann. Mag., 1863, p. 266.

Oki-no-Shima, Takano-Shima (Ad.).

Microtheca crenellifera A. Ad. Conch. Icon., Vol. 19, pl. 3, f. 23.

Japan (Ad.).

Lippistes rollei v. Martens. Nachrbl. d. m. Ges., 1894, p. 135.

Iki, in fine sand.

STOMATELLIDÆ.

Stomatella lyrata Pilsbry. Man. Conch., XII, p. 12, pl. 2, f. 3–5.

Kishiu (Stearns).

This abundant species attains a diameter of 15 mm. It may be the same as the alleged Japanese *S. articulata*.

Stomatella articulata A. Adams. Pils., Man. Conch., XII, p. 13, pl. 52, f. 43; Dkr., Index, p. 145.

Japan (Dkr.). Originally described from Australia and Lord Hood's Island. Does it really occur in Japanese Seas?

Stomatella orbiculata A. Adams. Pilsbry, Man. Conch., XI, p. 16, pl. 52, f. 44, 45; Dkr., Index, p. 145.

Japan (Dkr.). Also reported from Mozambique (Cuming) and Darnley I., Torres Sts. (Brazer).

Stomatella japonica A. Adams. Pilsbry, Manual XII, p. 20, pl. 53, f. 97.

Japan (Cuming); Deshima (Dkr.); Nagasaki (Lischke).

Niphonia pulchella A. Adams. Ad., Ann. Mag. N. H. (3), 1860, p. 336; Pils., Man. Conch., XII, p. 29.

Off Mino-Shima, 63 fms. (Ad.).

Stomatia phymotis Hebling. Pilsbry, Manual of Conch., XII, p. 30; Dkr., Index, p. 146.

Said to occur in Japan. Mr. Stearns obtained many specimens at Ohon-me I., Liukiu group.

Stomatia rubra Lamarck. Pilsbry, Man. Conch., XII, p. 33; Dkr., Index, p. 146; pl. 6, f. 11–13.

Strait of Corea (Ad.); Inland Sea of Japan (Stearns); Bay of Yedo (Lischke).

The color varies from a deep crimson to orange.

Stomatia splendidula A. Adams. Pilsbry, Man. Conch., XII, p. 34; Dkr., Index, p. 145.

Japanese Sea (Ad.).

Gena dilecta Gould. Otia Conch., p. 109; Pilsbry, Man. Conch., XII, p. 40, pl. 55, f. 33.

Hakodate Bay, on shells (Stimpson).

Gena lutea (Linné) Adams. Pils., Man. Conch., XII, p. 44, pl. 2, f. 29–31.

Japan (Dkr.).

Gena varia A. Adams. Pils., Man. Conch., XII. p. 45, pl. 55, f. 19–21.

Japan (Dkr.).

HALIOTIDÆ.

Haliotis (Padollus) ovina Gmelin. Pils., Man. Conch., XII, p. 124, pl. 19, f. 7.

Three specimens of the reddish typical form collected by Mr. Stearns.

Haliotis gigantea Gmelin. Pilsbry, Man. Conch., XII, p. 84. *H. sieboldii* and *H. discus* Reeve.

Kii coast (Stearns, with numerous pearls of same); Nagasaki, Yedo, Hakodate (Lischke).

Haliotis gigantea discus Rve. Yesso (Stearns).

From this locality forms referable to both *discus* and *kamtschatkana*. Simoda and Hakodate (Stimp.); Goto Is. (Ad.).

Haliotis planata Sowerby. Pilsbry, Man. Conch., XII, p. 99, pl. 49, f. 20, 21, 22.

Philippines (Sowb.); Viti Is. (Garrett!); Japan (Stearns).

Haliotis japonica Reeve. Pilsbry, Man. Conch., XII, pl. 14, f. 77+*H. aquatilis* and *H. incisa* Rve.

Japan (Rve.).

Haliotis diversicolor Reeve. Pilsbry, Man. Conch., XII, p. 104, 105.

Sagami, Awa, Idzu and Kii coast (Stearns).

This specific name covers the following forms, the distinctive features of which are well bridged by specimens in the large quantity collected by Mr. Stearns.

H. supertexta Lischke. Jap. Meeres-Conch., II, p. 92, pl. 6, f. 13–15.

Nagasaki (Lischke).

H. exigua Dunker. Index, p. 148, pl. 6, f. 8–10.

This is merely a young shell, easily matched in any series of young *supertexta*.

H. gruneri Philippi. Pilsbry, Man. Conch., XII, p. 105, pl. 47, f. 1, 2.

Nagasaki, Yedo (Lischke).

Haliotis speciosa Reeve. Conch. Icon., f. 47.

Japan (Mus. Loebbecke, *teste* Weinkauff).

Haliotis (Teinotis) asinina Linn. Pils., Man. Conch., XII, p. 126, pl. 14, f. 76.

Japan (Weinkauff; Stearns).

SCISSURELLIDÆ.

Scissurella japonica A. Adams. Pils., Man. Conch., XII, p. 59.

Mino-Shima, 63 fms., Seto-Uchi, O-Shima (Ad.).

Scissurella lamellata A. Adams. Pils., Man. Conch., XII, p. 59.

Mino-Shima, 63 fms., Goto, 71 fms., O-Shima, 26 fms. (Ad.).

Scissurella turbinata A. Adams. Pils., Man. Conch., XII, p. 59.

Mino-Shima, 63 fms. (Ad.).

Scissurella concinna A. Adams. Pils., Man. Conch., XII, p. 59.

Rifunsiri, 35 fms. (Ad.).

Scissurella staminea A. Adams. Pils., Man. Conch., XII, p. 60.

Tsu-Shima, 25 fms. (Ad.).

Schismope carinata A. Adams. Pils., Man. Conch., XII, p. 67.

Okosiri, 35 fms., Seto-Uchi, 16 fms., Goto, 71 fms. (Ad.).

Schismope modesta A. Adams. Pils., Man. Conch., XII, p. 67.

Tabu-Shima, 25 fms. (Ad.).

Schismope miranda A. Adams. Pils., Man. Conch., XII, p. 67.

Mino-Shima, 63 fms. (Ad.).

PLEUROTOMARIIDÆ.

Pleurotomaria beyrichi Hilgendorf. v. Martens, Conch. Mittheil., i, p. 33, pl. 7; Pilsbry, Man. Conch., XII. p. 71, pl. 56, f. 7–9.

Japan.

FISSURELLIDÆ.

Fissurellidinæ.

Macroschisma macroschisma (Chemn.) Dillwyn.

Patella macroschisma Chemnitz, Conchyl. Cab., XI, p. 184, pl. 197, f. 1923, 1924 (1795).

Patella macroschisma Wood, Index Testac., pl. 38, fig. 102*a* (1828).

Patella macroschisma Dillw., Descript. Cat. Rec. Shells, II, p. 1062, (1817); reference to Humphreys excluded.

Fissurella macroschima Desh., in Lam. An. s. Vert. Edit. 2, VII, p. 603 (exclusive of all but first reference) 1836.

Macrochisma maxima A. Adams, P. Z. S., 1850, p. 202; H. & A. Adams, Gen. Rec. Moll., III, pl. 51, fig. 5, (1858).

Macroschisma maxima Pils., Man. Conch., XII, p. 192 (copy of Adams' description and figure).

Not . . . . . Humphreys and DaCosta, Conch., pl. 7, f. 3.

Not *Fissurella macroschisma* Sowerby, Genera of Shells, *Fiss.*, f. 5, =*M. hiatula* Swains.

Not *Fissurella macroschisma* Sowb., Conch. Illustr., f. 39.

Not *Macrochisma maxima* Sowb., Thes. Conch., III, pl. 244, f. 216, 217.

The prominent specific characters of this form are its very large perforation which is *suddenly dilated* posteriorly to double the width of its middle portion. The anterior part of the shell has several carinæ. In *M. hiatula* Sw., the hole is not thus dilated posteriorly, nor is it so in the various figures of Humphreys and Sowerby referred to above. Chemnitz reports the species from Japan.

Macroschisma sinensis A. Adams. Pl. VI, figs. 6, 7, 8.
Pilsbry, Manual of Conch., XII, p. 190, pl. 59, f. 56–59.

Tabu-Shima (Ad.); Nemoto, Boshiu (Stearns, twelve specimens).

Shell oblong, the length slightly exceeding twice the breadth; lateral margins slightly convex, subparallel, anterior margin well rounded, posterior margin more or less truncate, often emarginate. Anterior slope straight or slightly convex, *more than half the length of the shell;* side slopes straight.

Surface sculptured with close, fine radial striæ, latticed by concentric raised striæ, which are much less obvious on old than on young shells; the anterior portion having about four *very inconspicuous* low radial ridges. Color either (1) dotted, speckled and obscurely banded with black on a pale buffish ground, or (2) blackish at the sides, crimson in front and behind, or (3) crimson throughout, with some faint blackish rays. Posterior slope very short, about equalling the length of the eroded portion behind the hole; generally concave, or broadly guttered behind the hole. *Perforation wedge-shaped, with nearly straight sides, gradually diverging* backward; very narrow in front, the back margin rounded, with an eroded tract behind it. *Length of hole slightly less than one-third the entire length of the shell.* Interior white with a bluish stain; hole-callus well marked, its edge stained with olive-black at the sides. Peristome strongly curved upward behind, much less so in front, the lateral margins nearly level.

Length 23½, breadth 10⅔, alt. 6 mm.

Length 23½, breadth 10⅔, alt. 6½ mm.

Length 21, breadth 9⅔, alt. 6 mm.

This species differs from *M. macroschisma* in the form of the perforation, which is wider posteriorly but not abruptly dilated there.

Macroschisma dilatata A. Adams. Sowerby, Thes., III, p. 206, f. 220; Man. Conch. XII, p. 193, pl. 59, f. 63.

Nemoto, Boshiu (Stearns).

The specimen referred to this species differs from *M. sinensis* in being shorter and broader, with shorter foramen and concave front slope. Color red, with a white ray on each side.

Macroschisma Lischkei Pilsbry. Pl. VI, figs. 1, 2, 3, 4, 5.

Nemoto, Boshiu (Stearns).

Shell oblong, *the length less than twice the breadth;* lateral margins convex, anterior margin well rounded, posterior margin bluntly rounded, subtruncate. Anterior slope straight, *decidedly less than half the length of the shell;* side slopes straight.

Surface sculptured with fine radial striæ, alternately larger and smaller, finer on the forward half of the side slopes; slightly decussated by growth lines. Color either (1) uniform black, or (2) closely speckled with black on a buff ground, or (3) crimson with or without dusky rays. *Posterior slope long* for the genus, about one-fifth the length of the entire shell; flattened or subconcave behind the hole, but not guttered. Perforation large, oblong, slightly narrower in front, and wider behind, with a *very narrow eroded tract* behind it. *Length of hole contained two and one-half times in length of shell.* Interior bluish-white, the hole-callus darker at the sides. When resting upon a plane surface, the peristome of the shell is seen to be *very much elevated behind, and but little less so in front;* the latero-basal margins strongly curved throughout.

Length 17⅔, breadth 9, alt. 5 mm.

Length 16, breadth 9¼, alt. 5 mm.

Twenty-two specimens collected. This seems a very distinct species; the position and proportions of hole, the long posterior and short anterior slope, and the strongly curved basal margins being especially characteristic, and unlike other described forms.

Emarginulinæ.

Fissuridea ticaonica Reeve. Sowb., Thes., Conch., III, p. 197, f. 110.

Described from Ticao, Philippines; reported from Japan by Dunker. One specimen collected by Mr. Stearns is referable to this species, although the foramen is rather shorter.

Fissuridea was proposed for a highly arched species from the Philippine Is. It has hitherto been regarded as a subgenus of *Fissurella*. Its synonymy is as follows:

Fissuridea Swains., Malacol., p. 356, 1840, type *F. galeata* Helbl.
Glyphis Carpenter, P. Z. S., 1856, p. 223, type *G. aspera* Esch.
Not *Glyphis* Agassiz, 1842, nor of Gibbes, 1848, a genus of fishes.
Fissuridea Pilsbry, Nautilus, Jan., 1892, p. 104.

Fissuridea sieboldii Reeve. Pilsbry, Man. Conch., XII, p. 204; Dkr., Index, pl. 6, f. 14, 15.

Bay of Yedo (Lischke). *Lucapina pfeifferi* Dkr., Malak., Bl., xxiv, p. 70, is said by Dunker to be identical.

Puncturella noachina Linné. Pilsbry, Man. Conch., XII, p. 229, pl. 27, f. 69, 70.

Japan (Dkr.).

Puncturella nobilis A. Adams. Pilsbry, Man. Conch., XII, p. 231, pl. 63, f. 34–37.

Okosiri (Ad.).

Puncturella (Cranopsis) pelex A. Adams. Pilsbry, Manual XII, p. 241, pl. 28, f. 8.

Off Mino-Shima, 63 fms. (Ad.).

Puncturella (Cranopsis) pileolus A. Adams. Pilsbry, Man. Conch., XII, p. 241, pl. 28, f. 9.

Off Mino-Shima (Ad.).

Zeidora reticulata A. Adams. Pils., Man. Conch., XII, p. 247, pl. 63, fig. between 16 and 20.

Mino-Shima (Ad.).

Zeidora calceolina A. Adams. Pils., Man. Conch., XII, p. 247, pl. 64, f. 27.

Strait of Corea, off Mino-Shima (Ad.).

Rimula cumingii A. Adams. Thes. Conch., III, p. 210, pl. 245, f. 1.

Japan (Dkr.).

Emarginula adamsiana Sowerby. Sowb., Thes. Conch., p. 214, f. 27, 28.

Japan (Sowb.). *E. solidula* Costa, a Mediterranean species is said to occur in Japan, but it requires confirmation.

Emarginula scabriuscula A. Ad. Conch. Icon., Vol. 19, pl. 5, f. 30.

Japan.

Emarginula maculata A. Adams. Ad., in Sowb., Thes. III, p. 215, f. 31, 32; Pils., Man. Conch., XII, p. 263.

Goto Is. (A. Ad.).

Emarginula japonica Sowerby. Thes. Conch., III, p. 216, f. 43, 44.

Emarginula altilis Gld. Gld., Otia, p. 116.

Kagoshima Bay, 10 fms.

Emarginula textilis Gould. Gld., Otia, p. 116.

Ooshima (N. P. E. E.).

Subemarginula picta Dkr. Dkr., Moll. Jap., p. 24, pl. 12, f. 15.

Deshima (Dkr.); Nagasaki (Lischke).

Subemarginula (Tugalia) gigas v. Martens. (*Saru-awabi*). Mart., Conch. Mittheil. II, p. 103, pl. 19; Pils., Man. Conch., XII, p. 286.

Northern Japan (Mts.).

Scutus unguis Linné. Pils., Man. Conch., XII, p. 289, pl. 40, f. 4–8. (*Parmophorus japonicus* Tapparone-Canefri.)

Nagasaki (Stearns).

Besides the synonyms given in the Manual of Conchology, *Patella scapha* Gmelin, Syst. Nat. 13, p. 3727, belongs to this species.

PHENACOLEPADIDÆ.

Phenacolepas pulchellus Lischke. Lischke, Jap. Meeres-Conch., II, p. 100, pl. 6, f. 20–23. (*Scutellina*).

Nagasaki (Lischke). The generic names *Scutella* and *Scutellina* being preoccupied, have been changed as follows:

Scutella Brod., P. Z. S., 1834, p. 47, not of Lam., 1816.
Scutellina Gray, P. Z. S., 1847, p. 168, not of Agassiz, 1841.
Phenacolepas Pilsbry, Nautilus, v, 89, Dec., 1891.

Phenacolepas unguiformis Gould. Gld., Otia, p. 115; Man. Conch., XII, p. 129. (*Scutellina*).

Kagoshima (N. P. E. E.).

Phenacolepas scobinatus Gould. Gld., Otia, p. 115; Man. Conch., XII, p. 129. (*Scutellina*).

Ooshima (N. P. E. E.).

(*Docoglossa*).

ACMÆIDÆ.

Acmæa schrenckii Lischke. Lischke, Jap. Meeres-Conch., I, p. 107, pl. 8, f 1–4. (plus *A. concinna* Lischke).

Nagasaki (Lischke); Ojima, Yokohama and Hakodate (Stearns).

A wonderfully variable limpet. In the large series collected at Ojima the typical *schrenkii* is represented by several varieties. Some have the color pattern shown in Lischke's figures, others a coarsely tessellated design; the radial riblets being either smooth or finely beaded. Another variety is the *concinna* of Lischke (Jap. Meeres-Conch., II, pl. 6, f. 16) rounder in outline, more elevated, and all over finely beaded, and mostly unicolored blackish; but many in-

termediate specimens between this and typical *schrenckii* occur. Still another form is smaller, more erect and elevated, with dull, tessellated or rayed exterior, and subobsolete radial striæ. The specimens from Hakodate are rather small. All of the forms of *A. schrenckii* have the interior stained with green or blue.

Acmæa heroldi Dkr. Pl. VI, figs. 13, 14, 15, 16, 17, 18.

Nagasaki and Deshima (Lischke); Kashi-azaki, Boshiu, Enoshima, Sagami (Stearns).

Great numbers of this species were obtained by Mr. Stearns. It is readily distinguishable from all forms of *A. schrenckii* by the brown-black and white (not blue or green) interior. Dunker's *P. pygmæa* is probably a synonym.

A white variety, ray-variegated with reddish-brown, occurs at Tokyo Harbor and Kamakura (Stearns).

Acmæa conulus Dkr. Man. Conch., XIII, pl. 9, f. 17, 18.

Yokohama, Enoshima, Tokyo Harbor (Stearns); Deshima (Nuhn); Nagasaki (Lischke).

Typical specimens agreeing with the figures cited were collected by Mr. Stearns.

Acmæa dorsuosa Gould. Man. Conch., XIII, p. 45, pl. 33, f. 88; pl. 9, f. 15, 16.

Hakodate (Gould); Ooshima (Challenger); Enoshima (Stearns).

Acmæa saccharina Linné. Man. Conch., XIII, pl. 36, f. 60–64.

Coast of Kii (Stearns); Ooshima (Challenger); Nagasaki (Lischke); Deshima (Nuhn).

Many specimens were collected, agreeing in the main with Reeve's *Patella lanx*. The inside has a wide black margin, interrupted at the positions of the principal ribs with white. Spatula is either stained irregularly with brown, or has a large black patch and numerous dots, somewhat as in the var. *stellaris* Q. & G.

Acmæa grata Gould. Otia Conch., p. 115.

North shores of Nippon (N. P. Exped.).

Acmæa patina Esch., *digitalis* Esch. and *testudinalis* Müll., have been reported from Japan, see Jap. Meeres-Conch., II, p. 93, etc.

LEPETIDÆ.

Lepeta cæca Müller. Pils., Man. Conch., XIII, p. 68, pl. 40, f. 29–32.

Northern Japan (Dkr.).

Lepeta (Cryptobranchia) concentrica Middendorff. Pils., Man. Conch., XIII, p. 69, pl. 40, f. 33–37.

Northern Japan, Aleutian Is.

PATELLIDÆ.

Patella (Scutellastra) stellæformis Reeve. Pilsbry, Man. of Conch., XIII, p. 98.

Yedo (Lischke); Tsu-Shima (A. Ad.); Japan (Stearns).

The specimens are like pl. 17, figs. 25, 27 of Man. Conch., rude and irregular.

Helcioniscus nigrisquamatus Reeve. Pl. VII, figs. 1, 2.
Pilsbry, Man. of Conch., XIII, p. 125, pl. 48, f. 13–15.

Coast of Prov. Ise (Stearns); Coast of Kii (Stearns); Ogasawara, Bonin Is. (Stearns).

The specimens from the Province of Kii are small. One is represented in figs. 1, 2, of pl. VII. Those from Ise are larger, agreeing well with Reeve's figures, and his type may very likely be from this region. As they grow older, the interior loses its black-brown spots. The localities "Australia" and "Chili" previously given for this species are false.

Helcioniscus nigrisquamatus boninensis Pils. Pl. VII, fig. 3.
Pilsbry, Man. Conch., XIII, p. 131, pl. 66, f. 1, 2; pl. 67, f. 3.

This is the large form from Bonin Is. (Stearns). It probably intergrades completely with *nigrisquamatus*, but all the specimens I have seen have a larger central spatula. A very elevated individual is figured.

Helcioniscus Stearnsii Pilsbry. Pl. VII, figs. 4, 5, 6.
Man. Conch., XIII, p. 132, pl. 48, f. 16–18.

Coast of Prov. of Kii (Stearns, 1890). This species is readily distinguished from *H. nigrisquamatus* by the more anteriorly curved blunter apex, more convex posterior slope, etc. The central spatula varies from chestnut clouded in its depth with creamy to cream color clouded with brown. It is more solid than specimens of *nigrisquamatus* of the same size.

Helcioniscus pallidus Gld. Man. of Conch., XIII, p. 133, pl. 67, f. 9, 10. *P. lamanonii* Schrenck, Amurl., pl. 14, f. 6–9.

Hakodate (Stearns, Stimpson, Schrenck, Dkr.); Yamada Harbor (Ann. Mag., 1875, XVI, p. 114).

Helcioniscus eucosmius Pilsbry. Pl. VII, figs. 7, 8, 9, 10.
Man. Conch., XIII, p. 148, pl. 71, f. 61–64.

Enoshima (Stearns); Hakodate (Stearns).

This is a solider, more erectly conical species than *H. amussitata* or *toreuma*, and the apex is less directed forward. The coloration, while characteristic, varies greatly. The species is not known from

any locality outside of Japan. It is a very abundant form at Enoshima. The central spatula is generally deep brown with a lighter spot in the cavity of the apex, but sometimes it is orange (fig. 8) or even in rare cases creamy.

Helcioniscus toreuma Reeve. Lischke, Jap. Meeres-Conch., I, pl. 8, f. 12–15; II, pl. 6, f. 12.

Nagasaki (Stearns, Lischke); Enoshima (Stearns); Hakodate (Stearns); Banda, Boshiu (Stearns).

Even Lischke's splendid series of figures do not exhaust the color variations of this Protean limpet. After examining several hundred examples I am unable to retain *P. amussitata* Rv. as a distinct species. The form I at one time called "*nigrolineata var. divergens*" is also merely a heavy, large *toreuma*.

Helcioniscus nigrolineatus Reeve. Lischke, l. c., I, pl. 8, f. 5–11; II, pl. 7, f. 1–6.

Enoshima (Stearns); Nagasaki (Lischke); Tsu-Shima (A. Ad.); Toba, S.-E. of Nippon (St. John).

The curious variety with vermiculate blackish concentric lines (Lischke, pl. 8, fig. 10) was also collected by Mr. Stearns.

[Note. *Helcioniscus exaratus* and *Patella clypeaster* have been reported from Japan, but on insufficient evidence; a specimen of *H. testudinarius* L. was brought from Japan by Mr. Stearns, but it probably was not native there].

AMPHINEURA.

LEPIDOPLEURIDÆ.

Lepidopleurus fuliginatus Adams & Reeve. Pilsbry, Man. Conch., XIV, p. 10.

Corea (Ad.).

Lepidopleurus concinnus Gould. Pilsbry, Man. Conch., XIV, p. 11.

Hakodate, on stones and shells (N. P. E. E.).

Lepidopleurus (Deshayesiella) curvatus Carpenter. Pilsbry, Man. Conch., XIV, p. 16.

Okosiri (A. Ad.).

ISCHNOCHITONIDÆ.

Chætopleura asperior Carpenter. Man. Conch. xv, p. 74, pl. 15, f. 38-41.

Tonicella marmorea Fabr. Pilsbry, Man. Conch., XIV, p. 41.

Northern Japan.

Tonicella submarmorea Midd. Pilsbry, Man. Conch., XIV, p. 42. *Catharina submarmorea* Dkr., Index, p. 159. *Ch. insignis* Rve.

Tonicella lineata Wood. Pilsbry, Man. Conch., XIV, p. 42.

Northern Japan.

Trachydermon (Spongioradsia) multidentatus Cpr. Pilsbry, Man. Conch., XIV, p. 85; XV, p.

Bonin Is. (N. P. E. E.).

Ischnochiton (Stenoradsia) lindholmi Schrenck. Schr., Reisen im Amurlande, II, p. 288, pl. 12, f. 9–16; Pils., Man., XIV, p. 85.

Bay of Hakodate (Schr.).

I have not seen this species.

Ischnochiton comptus Gould. Pils., Man. Conch., XIV, p. 117.

Ooshima, Bonin and Liukiu Is. (Stimp.).

Ischnochiton (Lepidozona) mertensi Midd. Pils., Man. XIV, p. 125.

Reported from Hakodate by Dkr., Index, p. 158.

Ischnochiton (Lepidozona) coreanicus Adams & Reeve. A. & R., Voy. Samarang, pl. 15, f. 9; Pils., Man. Conch., XIV, p. 129.

Corean Archipelago, under stones (Ad.); Bay of Hakodate (Schrenck).

Ischnochiton (Lepidozona) craticulatus Gould. Pils., Man. Conch., XV, p. 84 pl. 17, f. 62, 63.

China Seas or Japan. (N. P. E. E.).

Type is in U. S. Nat. Museum.

Ischnochiton cultratus Carpenter. Pils., Man. Conch., XV, p. 82, pl. 17, f. 57-59.

Hakodate (N. P. E. E.).

Type is in U. S. Nat. Museum.

Ischnochiton (Ischnoradsia) hakodadensis Carpenter. Pils., Man. Conch., XIV, p. 147, pl. 19, f. 64–66.

Hakodate (N. P. E. E.).

Type is in Mus. Phila. Acad.

Ischnochiton (Ischnoradsia) albrechti Schrenck. Pils., Man. Conch., XIV, p. 147, pl. 19, f. 70–74. *Lepidoradia granofilosa* Cpr.

Hakodate (Schrenck); Endermo Harbor (St. John, Smith).

Callistochiton jacobæus Gould. Pils., Man. Conch., XIV, p. 267.

Simoda (N. P. E. E.).

Nuttallina alternata Sowerby. Pils., Man. Conch., XIV, p. 281.

Japan (Cuming).

MOPALIIDÆ.

Mopalia middendorffii Schrenck. Pils., Man. Conch., XIV, p. 301.

Bay of Castries (Schr.).

Placiphorella stimpsonii Gould. Pils., Man. of Conch., XIV, p. 307, pl. 62, f. 84–87.

Hakodate Bay, in 25 fms. (N. P. E. E.).

ACANTHOCHITIDÆ.

Acanthochites rubrolineatus Lischke. Lischke, Jap. Meeres-Conch., III, p. 73, pl. 5, f. 12; Pils., Man., XV, p. 18.

Nagasaki (Lischke); E. coast of Japan (Stearns).

Acanthochites achates Gould. Gld., Otia, p. 118.

Kikaia and Hakodate Bay (N. P. E. E.).

Acanthochites defilippii Tapparone-Canefri. Pils., Man. Conch., XV, p. 19. *Stectoplax porrecta* Cpr. *mss.*

Yokohama ("Magenta").

Acanthochites circellatus Adams & Reeve. Rve., Conch. Icon., f. 180.

I. of Quelpart, Corean Archipelago (Ad.).

Acanthochites scutiger Adams & Reeve. Rve., Conch. Icon., f. 178.

Cryptochiton stelleri Middendorff. Pils., Man. Conch., XV, p. 48, pl. 7, f. 9–13; Smith, Ann. Mag., XVI, 1875, p. 115.

Endermo Harbor (St. John, Smith), and northward.

Two varieties have been described from the western Pacific, *violaceus* Nordm. and *apicalis* Pils.

CHITONIDÆ.

Chiton aquatilis Reeve. Rve., Conch. Icon., f. 73; Pilsbry, Man., XIV, p. 169.

Tsu-Shima.

Probably *Ch. densiliratus* Cpr. (Pils., Manual, p. 169) is a synonym.

Liolophura japonica Lischke. Pils., Manual, XIV, p. 242, pl. 52, f. 41–44. *Ch. defilippii* Tap.-Can.

Enoshima (Stearns); Ooshima (Challenger); Nagasaki (Lischke).

Liolophura japonica var. **tessellata** Pils. Enoshima (Stearns).

Liolophura loochooana Brod. & Sowb. Pils., Man., XIV, p. 244.

Loo Choo Is. (Belcher).

SCAPHOPODA.

DENTALIIDÆ.

Dentalium vernedei Hanley. Sowb., Thes. Conch., III, p. 101, f. 3.

Japan (Dkr.).

Dentalium octogonum Lam. Lischke, Jap. Meeres-Conch., III, pl. 5, f. 1–3. *D. hexagonum* Gld., Lischke, l. c., pl. 5, f. 4–7; *D. japonicum* Dkr., Ind. Moll. Mar. Jap., p. 153, pl. 5, f. 2.

Kii coast (Stearns); Matoza and Ooshima Harbors, 6–8 fms. (St. John).

From a study of several hundred specimens collected by Mr. Stearns I am disposed to consider *octogonum*, *hexagonum* and *japonicum* merely forms of one species. The development of interstitial longitudinal riblets is very variable.

Dentalium sexcostatum Sby. Ann. Mag., 1875, Vol. XVI, p. 113.

Cape Shima, 18 fath., Goza Harb., 6 fath., sandy mud (St. John).

Dentalium weinkauffi Dunker. Dkr., Index, p. 153, pl. 5, f. 1.

Japan (Dkr.); Bishiu coast (Stearns).

In the specimens before me the longitudinal riblets do not extend so far toward the aperture as Dunker's figure shows.

Dentalium buccinulum Gld. Otia Conch., p. 119.

Kagoshima (Stimpson).

Dentalium yokohamense Watson. Challenger Gastrop, 1873–6, XV, p. 11, pl. 2, f.

Yokohama, 8 fathoms (Chall.).

Dentalium semipolitum Sby. Ann. Mag., 1875, XVI, p. 113.

Cape Shima and Matoza Harb., 6–18 fath. (St. John).

PELECYPODA.

TELEODESMACEA.

(*Adesmacea.*)

TEREDINIDÆ.

Teredo japonica Clessin. Conchyl. Cab., p. 78, pl. 20, f. 9, 10.

Japan.

PHOLADIDÆ.

Pholas (Barnea) fragilis Sowerby. Thes., II, p. 488, f. 92, 93.

Nagasaki (Lischke).

Pholas (Barnea) manilensis Phil. Abbild., III, p. 51, pl. 1, f. 2.

Numerous fresh specimens collected by Stearns, but exact locality unknown. The margins of the gape are less acutely denticulate than in typical examples, and more concave. These differences probably indicate a distinct race, which may be called var. *inornata*.

Zirphæa crispata Linné, Japan (Dkr., Stearns).

Jouannetia cumingii Sowb. P. Z. S., 1849, p. 161, pl. 5, f. 3
Japan (Dkr.).

Parapholas penita Conrad. Tokyo (Dkr.).

Parapholas piriformis Dunker. Index, p. 171, pl. 14, f. 7.
Japan (Dunker).

Martesia striata Linné. Japan (Dunker).

(*Myacea*).

GASTROCHÆNIDÆ.

Gastrochæna grandis Desh. Dkr., Index, p. 171, pl. 14, f. 10, 11.
Japan (Dkr.).

Gastrochæna mumia Spengl. Japan (Dkr.).

SAXICAVIDÆ.

Glycimeris generosa Gld. Japan (Stearns).

Glycimeris japonica A. Adams. Ad., P. Z. S., 1849, p. 170, pl. 6, f. 5.
Bay of Yedo (Lischke); Bay of Hakodate (Gld., for *P. fragilis* Gld., Otia Conch., p. 163).

Glycimeris plicata Mont. Jeffreys, Brit. Conch., III, p. 75, pl. 3, f. 2.
Corea Strait (Jeffreys).

Saxicava arctica Linn. Ohosaka (Lischke); Hakodate (Schrenck); Nemoto, Boshiu (Stearns).

CORBULIDÆ.

Corbula erythrodon Lam.
Prov. Kii (Stearns); Yokohama, Yedo, Nagasaki (Lischke).

Corbula pallida Hinds. C. Icon., f. 4.
Japan (Dkr.).

Corbula bifrons A. Ad. Ann. Mag. N. H., 1860, V, p. 412.
Strait of Corea, 63 fms., off Mino-Shima; Seto-Uchi (Ad.).

Corbula venusta Gld. Otia Conch., p. 164; Reisen im Amurl., pl. 25, f. 1–4.
Hakodate Bay, 5–8 fathoms, shelly sand (Stimpson).

Corbula cuneata Hinds. Moll. Voy. Sulphur, pl. 20, f. 6.
Mososeki, Kuro-Shima (Ad.).

Erodona amurensis Schrenck. Reis. im Amurl., p. 584, pl. 25, f. 5–8.
Northern Japan.

Erodona labiata Maton. C. Icon., *Corbula*, sp. 28.
Japan (Dkr.).

Basterotia gouldii A. Ad. Dkr., Index, p. 178, pl. 9, f. 7–11.

Seto-Uchi, Yobuko, Mososeki (Ad.).

Basterotia stimpsonii A. Ad. Ann. Mag., 1864, p. 310; 1868, p. 366.

Mososeki; Akasi (Ad.)

Basterotia recluzi A. Ad. *Ibid.* Yobuko (Ad.).

MYACIDÆ.

Mya arenaria var. **japonica** Jay. Jay in Perry's U. S. Japan Exped., II, pl. 1, f. 7, 10. (+" Mya acuta Say," Sowb., C. Icon., XX, pl. 3, f. 12).

East coast Nippon (Stearns). The specimens are small, thin, and attenuated posteriorly. Yedo, Nagasaki (Lischke); Hakodate (Perry).

Mya truncata Linné. Midd., Sib. Reis. II, pl. 25, f. 11-14. Ochotch Sea (Midd.).

Cryptomya elliptica A. Ad. Dkr., Index, pl. 7, f. 17–19.

Mososeki (Ad.).

Cryptomya mindoroensis Ads. & Rve. Zool. Samarang, p. 82, pl. 23, f. 13.

Akasi (Ad.).

Cryptomya decurtata A. Ad. Ann. Mag., 1868, p. 366.

Kuro-Shima (Ad.).

(*Mactracea*).

MESODESMATIDÆ.

Paphia striata Chemn. Japan (Dkr., Index, p. 195).

Ervillia japonica A. Ad. Ann. Mag. N. H., 1862, p. 224.

Tsu-Shima (Ad.).

Ervillia bisculpta Gould. Otia Conch., p. 166; (syn.: E. australis Angas, P. Z. S., 1877, p. 175, pl. 26, f. 21).

Kagoshima, 5 fath., sand (Stimpson).

Ervillia livida Gld. Otia Conch., p. 166.

Kagoshima Bay, 5 fath., sand (Stimp.).

Cæcella chinensis Desh. Lischke, J. M. C., I, p. 133, pl. 10, f. 5, 6.

Nagasaki (Lischke).

Donacilla picta Dkr. Index, p. 195, pl. 7, f. 7–10.

CARDILIIDÆ.

Cardilia semisulcata Desh. Dkr., Index, p. 213, pl. 8, f. 1–3.

Bay of Yedo (Lischke).

MACTRIDÆ.

Mactra sulcataria Deshayes. C. Icon., f. 5.

Nagasaki and Tokyo Harbor (Lischke); Yokosko Harbor and Sagami Bay (Stearns); Hakodate (Schrenck).

Mactra ornata Gray. C. Icon., f. 58.

Japan (Dkr.).

Mactra spectabilis Lischke. J. M. C., II, p. 120, pl. 11, f. 1, 2.

Kiushiu (Lischke); Inland Sea (Stearns).

Mactra veneriformis Deshayes. C. Icon., f. 2; Conchyl. Cab., p. 63, pl. 22, f. 3, 8a.

Kiushiu, Tokyo Harbor (Lischke). Numerous young specimens taken by Stearns.

Mactra veneriformis var. **zonata** Lischke. J. M. C., II, p. 121, pl. 9, f. 7, 8.

Bay of Yedo.

Mactra lurida Phil. Abbild. II, p. 136, pl. 3, f. 3.

Luchu Is.

Mactra crossei Dkr. Index, p. 183, pl. 7, f. 1–4.

Tokyo (Rein).

Mactra bonneaui Bernardi. Journ. de Conch., 1858, p. 92, pl. 2, f. 2.

Strait of Tartary (Bern.); Coast of Prov. Kii (Stearns). It is very like *M. veneroides*.

Mactra straminea Dkr. Index, p. 183, pl. 7, f. 5, 6.

Japan (Dkr.).

Mactra sachalinensis Schrenck. Amurlandes Moll., p. 575, t. 23, f. 3–7; (Syn.: *M. luhdorfii* Dkr., Novit. Conch., p. 60, pl. 20, f. a, c.

Hakodate, used very commonly for food (Stearns, *et al*).

Spisula grayana Schrenck. Phil., Abbild., I, p. 165, pl. 1, f. 1, as *M. ponderosa*.

Ochotch Sea (Midd.).

Raeta pulchella Adams & Rve. Zool. Samarang, pl. 23, f. 1; (Syn. *M. rostralis* Desh., C. Icon., VIII, *Mactra*, f. 119).

Off Yokohama in 8 to 14 fathoms (Chall.); Yokohama (Stearns).

Raeta pellicula Desh. C. Icon., f. 124. Japan (Cuming).

Raeta yokohamensis n. sp. Pl. III, figs. 4, 5.

Shell small, thin, fragile, white, inflated, ovate-triangular; beaks somewhat posterior. Anterior end broad, rounded, posterior end very narrow, triangular; beaks and dorsal slopes of valves coarsely concentrically corrugated; median and lower portion of valves smooth. Lunule large; chondrophore small, but little projecting. Adductor and pallial impressions not distinguishable. Length 17, alt. 12, diam. 8⅓ mm.

Yokohama (Stearns).

Eastonia (Merope) aegyptiaca Chemn. Japan (Dkr.).

Tresus nuttalli Conrad. Midd., Mal. Ross., III, pl. 19, f. 1–4 (*maxima* Midd.).
Yedo (Lischke); Hakodate (Stimp.); Yokohama Bay (Stearns).

Lutraria maxima Jonas. C. Icon., *Lutraria*, f. 11.
Nagasaki (Lischke).

Lutraria arcuata Desh. C. Icon., f. 6.
Japan (Dkr.).

Lutraria sieboldi Desh. C. Icon., VIII, f. 15.
Japan (Cuming).

Lutraria lucida Gld. Otia Conch., p. 168.
Kagoshima (Stimpson).

(*Solenacea*).

SOLENIDÆ.

Solen grandis Dunker. Novit. Conch., p. 71, pl. 24, f. 5.
Nagasaki (Lischke); Japan (Stearns).

Solen linearis Chemnitz. Conchyl. Cab., p. 23, pl. 9, f. 4.
Japan (Dunker).

Solen corneus Lamarck. Conchyl. Cab., p. 9, pl. 3, f. 8, 9.
Japan (Dunker).

Solen gouldii Conrad. Dkr., Index, p. 173, pl. 16, f. 11.
Nagasaki, Hakokate (Stearns); Enoshima.

Solen sicarius Gould. Conchyl. Cab., p. 24, pl. 9, f. 1.
Japan Sea (Dunker).

Solen gracilis Gld. Otia Conch., p. 165; C. Icon., XIX, pl. 4, f. 17.
Hakodate, sandy beaches (Stimpson).

Solen strictus Gld. Otia Conch., p. 165.
Hakodate Bay (Stimpson).

Solen incertus Clessin. Conchyl. Cab., p. 31, pl. 12, f. 8.
Hakodate (?).

Solen krusensternii Schrenck. Reisen im Amurl., II, p. 594, pl. 25, f. 9–12.
Hakodate (Schrenck); Akashi Bay (Stearns).

Cultellus attenuatus Dkr. Novit. Conch., p. 72, pl. 24, f. 4.
Japan (Dkr.).

Cultellus marmoratus Dunker. Index, p. 174, pl. 7, f. 24.
Japan (Dkr.).

Cultellus philippianus Dunker. Index, p. 174, pl. 7, f. 23.

Japan (Dunker).

Cultellus cultellus Linné. Bay of Yedo (Lischke).

Siliqua pulchella Dunker. Novit. Conch., p. 20, pl. 6, f. 4, 5.

Kiushiu and Bay of Yedo (Lischke); between Tokyo and Ooshima (Stearns).

Siliqua japonica Dunker. Conchyl. Cab., p. 63, pl. 18, f. 5.

Japan (Dkr.). Is it identical with the preceding?

Siliqua sodalis Gld. Otia Conch., p. 165.

Hakodate Bay (Stimpson).

Siliqua minima Gmelin. Conchyl. Cab., p. 68, pl. 5, f. 1, 2. (Syn.: *S. albidus* A. & R., Zool. Samarang, pl. 23, f. 15).

Japan Sea (Dunker).

Solecurtus constrictus Lamarck. Dkr., Index, pl. 7, f. 25.

Japan (Dkr.).

Solecurtus (Macha) divaricata Lischke. Dkr., Index, p. 175, pl. 7, f. 26; Lischke, J. M. C., I, p. 142, pl. 10, f. 1, 2.

Nagasaki (Lischke); Inland Sea; Enoshima (Stearns).

(*Tellinacea*).

DONACIDÆ.

Donax australis Lam. Roemer, Monogr. Donacidæ, pl. 17, f. 4–6.

Boshiu (Stearns). Most of the specimens are deep purple within, like Römer's figure of *D. deshayesii* Dkr.

Donax bicolor Gmelin. Conchyl. Cab., pl. 16, f. 12–16.

Nagasaki (Lischke); Yokohama (Martens). These localities probably pertain to specimens which agree with Reeve's figures, and are, according to Bertin, *D. australis.*

Donax dysoni Deshayes. C. Icon., VIII, f. 54.

Nagasaki, Tokyo Harbor (Lischke); Yokohama Harbor (Martens).

Donax introradiatus Reeve. C. Icon., f. 65; Conchyl. Cab., p. 75, pl. 13, f. 5–8.

Japan (Römer).

Donax semigranosus Dkr. Index, p. 193, pl. 7, f. 14, 15, 16 (1882).

Japan (Dkr., Stearns). Some specimens are yellow outside; but the prevailing form is yellow-stained white, with blue markings toward the beaks, and more or less purple inside. I am disposed to believe this species a color variety of *D. proximus* Bertin.

Donax proximus Bertin. Nouv. Arch. du Mus., 1881, p. 100, pl. 3, f. 2 a, c.

Japan (Allart, Stearns).

PSAMMOBIIDÆ.

Asaphis deflorata Linné.

It is doubtful whether the oriental species is really Linnæus' form, which may be the same as the West Indian species *A. coccinea* Martyn. If this be the case, the East Asian *Asaphis* may be more properly called *A. rugosa* Lam.

Stearns procured specimens in Japan (exact locality unknown), and in the Loo Choo group.

Psammobia bipartita Phil. Conch. Cab., VI, p. 100, pl. 10, f. 92.

Bay of Yedo (Lischke, *P. cærulescens*).

Psammobia occidens Chemn. C. Icon., f. 11. Japan (Dkr.).

Psammobia oriens Desh. C. Icon., f. 1. Japan (Dkr.).

Psammobia ornata Desh. C. Icon., f. 26. Bay of Yedo (Lischke).

Psammobia corrugata Desh. C. Icon., f. 9. Japan (Dkr.).

Psammobia radiata Dkr. Abbild., I, p. 94, pl. 2, f. 5 (*P. amethystus* Rve., C. Icon., f. 19).

Japan (Dkr.).

Soletellina chinensis Chemn. C. Icon., f. 9, as *S. truncata*.

Japan (Dkr.).

Soletellina boeddinghausi Lischke. J. M. C., II, p. 118, pl. 9, f. 9.

Nagasaki (Lischke); Inland Sea (Stearns).

Soletellina violacea Lam. C. Icon., f. 4. Nagasaki (Lischke).

Soletellina dephos Linné. Conchyl. Cab., VI, p. 68, pl. 7, f. 53, 54.

Japan (Dkr.).

Soletellina moesta Lischke. J. M. C., III, p. 99, pl. 8, f. 4–6.

Yedo (Lischke). One specimen collected by Stearns measures 38 mm. long.

Soletellina atrata Desh. C. Icon., f. 14. Tokyo (Dkr.).

Soletellina olivacea Jay. J. M. C., I, p. 131; III, p. 98, pl. 8, f. 7–12.

Nagasaki (Lischke); Bay of Yedo (Perry); near Sakai, Inland Sea (Stearns).

Soletellina japonica Desh. C. Icon., f. 16. Japan (Siebold).

Soleteilina nuttalli Conr. Journ. Acad. N. S. Phila., 1837, pl. 17, f. 6; *Psam. decora* Hinds, Voy. Sulphur, pl. 9, f. 6, 7.

Bay of Yedo (Lischke); Hakodate (Schrenck, Stimpson).

SEMELIDÆ.

Semele zebuensis Hanley. C. Icon., VIII, *Amphidesma*, f. 25.

Japan (Dkr.).

Semele sinensis A. Ad. *Ibid*, f. 28. Japan (Dkr.).

Semele californica A. Ad. *Ibid*, f. 19; Schrenck, Amurl. Moll., pl. 22, f. 10.

Strait of Tartary.

Semele hanleyi Angas. P. Z. S., 1878, p. 859, pl. 54, f. 1.

Japan (Belcher).

Semele duplicata Gld. Otia Conch., p. 166.

Kagoshima Bay, 6 fath., sand (Stimp.).

Theora lubrica Gld. Dkr., Index, p. 181, pl. 7, f. 20–22.

Hakodate Bay, in 6 fath., mud (Stimpson).

Theora iridescens Hinds. Chall. Lamell, XIII, p. 89, pl. V, f. 6, 6f.

Yobuko (A. Adams).

Theora fragilis A. Ad. P. Z. S., 1855, p. 226. Japan.

Endopleura nitida Gld. Otia, p. 162. Japan (A. Ad.).

Iacra japonica A. Ad. Ann. Mag. N. H., 1864, p. 308.

Oki-no-Shima (Ad.).

Leptomya spectabilis Hanley. P. Z. S., 1882, p. 576; Jour. Lin. Soc., XVI, 1883, pl. 12, f. 7.

Japan? (Mus. Hanley).

Leptomya cochlearis Hinds. Goto, Seto-Uchi (A. Ad.).

Leptomya adunca Gld. (Scrobicularia). Otia, p. 167. Tsu-Shima (Ad.).

TELLINIDÆ.

Tellina perna Spengl. Japan (Dkr., Stearns).

Tellina vulsella Chemn. C. Icon., f. 56.

Kiushiu and Bay of Yedo (Lischke); Japan (Stearns).

Tellina pulcherrima Sowb. Tank. Cat. App., pl. 1, f. 1.

Bay of Yedo (Lischke).

Tellina staurella Lam. Japan (Stearns).

Küsters' Conchyl. Cab., Tellinidæ, p. 19, pl. 2, f. 11–13; pl. 7, f. 6–8. "*T. cruciata* Spengl.".

Tellina galatea Lam. Abbild., I, p. 71, pl. 1, f. 1 (*T. sericina*).

Tellina diaphana Desh. Conchyl. Cab., p. 47, pl. 13, f. 7, 8, 9.

Nagasaki (Birileff).

Tellina ovalis Sowb. C. Icon., f. 105. Bay of Yedo (Lischke).

Tellina jedoensis Lischke. J. M. C., III, p. 92, pl. 9, f. 1–3.

Bay of Yedo (Lischke); Kamakura (Stearns).

Tellina rosea Spengler. Conchyl. Cab., p. 57, pl. 16, f. 1, 2, 3.

Hakodate (Schrenck).

Tellina compressissima Reeve. C. Icon., f. 328. Japan.

Tellina venulosa Schrenck. (*lutea* Gray). Conchyl. Cab., p. 121, pl. 28, f. 8–10; Midd. Sib. Reise, pl. 21, f. 2, 3.

Hakodate and northward (Schrenck).

Tellina nux Hanley. Thes., I, p. 251, pl. 56, f. 33.

Deshima (Dkr.).

Tellina lubrica Gld. Otia Conch., p. 167.

Hakodate Bay, 6 fath., mud (Stimp.).

Gastrana yantaiensis Crosse & Debeaux. J. C., 1863, pl. 9, f. 2.

Japan (Dkr.).

Gastrana japonica v. Martens. Conchyl. Cab., p. 275, pl. 51, f. 5–8, 9.

Yokokama Harbor.

Arcopagia siamensis Martens. P. Z. S., 1860, p. 18.

Inland Sea (Stearns). A short form.

Macoma nasuta Conrad. Conchyl. Cab., p. 229, pl. 44, f. 5–8.

Hakodate.

Macoma inquinata Desh., *T. incongrua* v. Martens. J. M. C., II, pl. 10, f. 12, 13

Yokohama Bay, Yedo, Nagasaki (Lischke); Prov. Kii (Stearns).

Tellina (Angulus) nitidula Dunker. Moll. Jap., p. 27, pl. 3, f. 14; J. M. C., II, pl. 10, f. 10, 11.

Nagasaki (Lischke); Deshima (Dkr.); Yokohama (Martens); Kamakura (Stearns).

Tellina rhomboides Q. & G. Astrol., III, p. 502, pl. 81, f. 4–7.

Bay of Yedo.

Tellina (Angulus) pallidula Lischke. J. M. C., II, p. 114, pl. 10, f. 6, 7.

Nagasaki (Rein).

Tellina rutila Dkr. Moll. Jap., p. 27, pl. 3, f. 6.

Deshima (Dkr.); Yokohama (Stearns); Nagasaki (Birileff).

Tellina iridella v. Martens. J. M. C., II, p. 114, pl. 10, f. 8, 9.

Nagasaki and Tokyo Bays (Lischke); Kamakura (Stearns).

Tellina iridescens Bens. Thes., I, p. 286, pl. 58, f. 88.

South Japan (Lischke).

Tellina minuta Lischke. J. M. C., III, p. 94, pl. 9, f. 4–6.

Bay of Yedo (Lischke).

Tellina praetexta v. Martens. Conchyl. Cab., p. 239, pl. 45, f. 8–10.

Yokohama Bay (Martens); Nagasaki, Yedo (Lischke); E. coast below Tokyo Harbor (Stearns).

Macoma ala Hanley. Conchyl. Cab., p. 236, pl. 45, f. 5–7.

Japan (Hanley).

Macoma dissimilis v. Martens. J. M. C., II, p. 115, pl. 10, f. 15–17.

Tokyo Bay (Martens).

Macoma edentula Brod. et Sowerby. Conchyl. Cab., p. 224, pl. 43, f. 7–10.

North Japan.

Macoma truncata Jonas. Conchyl. Cab., p. 248, pl. 47, f. 4–6.

Tokyo Bay (Lischke).

Macoma praemitis Römer. Conchyl. Cab., p. 257, pl. 48, f. 7–9.

Japan (Roemer, Stearns).

Macoma inconspicua Broderip et Sowerby. Conchyl. Cab., p. 220, pl. 42, f. 7-10.

Hakodate.

Macoma lenticularis Sowb. C. Icon., f. 342. Japan.

Macoma secta Conr. (*T. japonica* Desh). Bay of Yedo (Lischke); Sakai, Inland Sea (Stearns).

(*Veneracea*).

GLAUCOMYIDÆ.

Glaucomya angulata Reeve. Odawara (Stearns).

PETRICOLIDÆ.

Petricola japonica Dkr. Index, p. 209, pl. 9, f. 4–6.

Kisenuma (Dkr.).

Petricola æquistriata Sowb. C. Icon., XIX, f. 19.

Hamagoi, Boshiu (Stearns).

VENERIDÆ.

Dosinia japonica Reeve. C. Icon., f. 17.

Hakodate (Schrenck); Yedo (Lischke).

Dosinia troscheli Lischke. J. M. C., III, p. 89, pl. 8, f. 1–3.

Inland Sea (Stearns); Southern Japan (Lischke).

Dosinia biscocta Reeve. C. Icon., f. 55.
Seto-Uchi, Mososeki (A. Ad.).

Dosinia gruneri Phil. Abbild., III, p. 23, pl. 8, f. 2.
Japan (Dkr.).

Dosinia bilunulata Gray. Roemer, Mon. *Dosinia*, in Novit. Conch., pl. 16, f. 1.
Yokohama; Sagama coast (Stearns); Bay of Yedo (Lischke).

Dosinia laminata Reeve. C. Icon., f. 14. Japan (Dkr.).

Dosinia sieboldi Reeve. C. Icon., f. 39. Japan (Siebold).

Dosinia sericea Reeve. C. Icon., f. 36. Seto-Uchi (A. Ad.).

Dosinia angulosa Phil. Abbild., II, p. 229, pl. 6, f. 1 (*Artemis penicillata* Rve., C. Icon., f. 33).
Tsu-Shima (Ad.).

Dosinia traillii A. Adams. P. Z. S., 1855, p. 223.
Yokohama (Ad.).

Dosinia histrio Gmel. Goto (Ad.).

Dosinia gibba A. Ad. Dkr., Index, p. 204, pl. 8, f. 4–6.
Tatiyama (A. Ad.).

Dosinia orbiculata Dkr. Index, p. 204, pl. 8, f. 12–14.
Japan (Dkr.).

Cyclina orientalis Sowerby. Conchyl. Cab., p. 113, pl. 28, f. 7–9.
Yokohama (Stearns).

Cyclina splendida Roemer. P. Z. S., 1860, p. 124.
Japan (Cuming).

Cyclina bombycina Roemer. P. Z. S., 1860, p. 124.
Japan (Cuming).

Cyclina flavida Desh. Tsu-Shima (A. Ad.).

Cyclina chinensis Chemn. C. Icon., f. 6.
Yokohama (Dkr.); Nagasaki, Yedo (Lischke); Tsu-Shima (Ad.).

Lucinopsis divaricata Lischke. J. M. C., III, p. 90, pl. 7, f. 12–14.
Yedo, (Lischke).

Lucinopsis decussata Phil. Enum. Moll. Sicil., I, p. 22, pl. 3, f. 5.
Japan (Dkr.).

Meretrix meretrix Linné. Conchyl. Cab., p. 15, pl. 3, f. 4, 5, 6, 8. 9.
Yedo, Hakodate, Yokohama (Lischke).

Meretrix morphina Lam. Nagasaki, Simoda, Yokohama (A. Ad.).

Meretrix lusoria Chemn. Nagasaki (Lischke); East coast, from Tokyo to Idzumi (Stearns).

Meretrix (Callista) limatula Sowb. Japan (Dkr.).

Meretrix (Callista) festiva Sowb. Japan (Dkr.).

Meretrix (Callista) chinensis Chemn. S. coast of Kii (Stearns); Nagasaki (Lischke).

Meretrix (Callista) squalida Sowb. Northern Japan (Schrenck).

Meretrix (Callista) pannosa Sowb. Northern Japan (Schrenck).

Meretrix (Callista) inflata Sowb. Japan (Dkr.).

Meretrix (Callista) indecora Phil. Roemer, Monogr., I, p. 81, pl. 24, f. 1.
Nagasaki (Birileff').

Lioconcha fulminea Bolt. Japan (Dkr.).

Lioconcha ornata Dillw. Japan (Dkr.).

Tivela damaoides Gray. Dkr., Index, p. 200.
Oki-no-Shima (Ad.).

Tivela radiata Sowerby. Tartary Strait (Schrenck).

Sunetta excavata Hanley.
Bay of Yedo and coast of Kiushiu (Lischke); Satanomosaki and Kuro-Shima (A. Ad.); Hakodate (Schrenck); Yokohama, Kamayama, Seta coast (Stearns).

Sunetta menstrualis Menke. Conchyl. Cab, p. 85, pl. 29, f. 10–12.
Japan (Reeve).

Clementia papyracea Gray. Sowerby, Thes. Conch., p. 700, pl. 151, f. 155.
Japan (A. Adams and Dkr.).

Clementia similis Sowb. Thes., II, p. 700, pl. 151, f. 154. Tatiyama (Ad.).

Venus (Mercenaria) stimpsoni Gld. Otia Conch., p. 169.
Hakodate, 6 fath. (Stimpson).

Venus toreuma Gld. Expl. Exped., f. 537.
Nagasaki (Lischke); Goto Is. and Satanomosaki (Ad.).

Venus jedoensis Lischke. Jap. Meeres-Conch., III, pl. 7, f. 1–9.
Bay of Yedo (Lischke); Yokohama (Stearns).

Venus lamellaris Schumacher. Conchyl. Cab., p. 142, pl. 8, f. 10, 11.
Japan (Dkr.).

Venus resticulata Sowb. Thes., II, p. 706, pl. 153, f. 23.
Japan (Dkr.).

Venus reticulata Linné. Japan (Dkr.).

Venus puellula Gld. Otia Conch., p. 169.

Oushima (Stimp.).

Cryptogramma squamosa Linné. Thes., II, pl. 156, f. 83, 84.

Cape Nomo, Kiushiu (Ad.).

Cryptogramma roemeri Dkr. Moll. Jap., p. 26, pl. 3, f. 10.

Deshima (Nuhn); Nagasaki (Lischke).

Chione marica Linné. C. Icon., *Venus*, f. 104.

Nagasaki (Lischke); Tsu-Shima, Mososeki (Ad.).

Chione crenifera Sowb. Seto-Uchi (Ad.).

Chione intersecta Sowb. Seto-Uchi (Ad.).

Chione striata Chemnitz. Conchyl. Cab., p. 127, pl. 5, f. 12–14.

Japan Sea.

Chione astartoides Beck. Northern Japan (Shrenck).

Chione foliacea Chemn. Abbild., II, pl. 5, f. 1.

Bay of Yedo (Lischke).

Chione isabellina Phil. Japan (Dkr.).

Chione calophylla Phil. Japan (Dkr.).

Chione cardioides Lam. Oki-no-Shima (Ad.).

Chione histrionica Brod. & Sby. Hakodate (Ad.).

Chione scabra Hanley.

Between Is. of Sikoku and Nippon, 50 fathoms, and Kobé, 8–50 fathoms (Challenger).

Chione roscida Gld. Otia Conch., p. 169.

Oushima, 15 fath., sand (Stimp.).

Chione undulata Born.

Between Is. of Sikoku and Nippon, 50 fathoms, sand bottom (Challenger).

Circe scripta Linné. Dunker, Index, p. 201.

Kishiu (Stearns).

Circe divaricata Chemn. Inland Sea (Stearns).

Circe æquivoca Chemn. Simidsu (A. Ad.).

Circe dispar Chemn. Roemer, *Venus*, p. 184, pl. 50, f. 1.

Nagasaki (Lischke); Tago, Kino-o-Shima (Ad.).

Circe gibbia Lam. Japan (A. Ad.).

Gouldia dilecta Gld. Otia Conch., p. 170.

Kagoshima (Stimp.).

Venerupis monstrosa Chemn.

Japan (Dkr., Stearns); Bay of Yedo (Lischke); Tsu-Shima, Kino-o-Shima (Ad.).

Venerupis irus Linné. Japan (Dkr., Stearns).

Venerupis semipurpurea Dkr. Index, p. 208.

Nemoto, Boshiu (Stearns). Hardly distinct from Japanese specimens referred to the preceding species.

Venerupis insignis Desh. Japan (Dkr.).

Venerupis exotica Lam. Delessert, Recueil, pl. 5, f. 3.

Japan (Dkr.).

Venerupis macrophylla Desh. Japan (Dkr.).

Tapes exaratus Phil. Abbild., II, p. 109, pl. 5, f. 6.

Kuro-Shima (Ad.).

Tapes liratus Phil. Abbild., III, p. 76. pl. 7, f. 5.

Japan (Dkr.).

Tapes sulcarius Lam. Japan (Dkr.).

Tapes undulatus Born. Abbild., III, pl. 7, f. 7 (*V. rimosa*).

Bay of Yedo (Lischke); Tatiyama (A. Ad.).

Tapes euglyptus Phil. Abbild., III, p. 76, pl. 7, f. 3; J. M. C., III, p. 80, pl. 6, f. 8–11.

Nagasaki (Lischke); Inland Sea (Stearns).

Tapes schnellianus Dkr. Lischke, J. M. C., III, p. 80, pl. 6, f. 1–4; Dkr., Novit. Conch., p. 75, pl. 25, f. 7–9.

Nagasaki, Yedo (Lischke); Inland Sea (Stearns).

Tapes amabilis Philippi. J. M. C., III, p. 82, pl. 6, f. 5–7.

Tago (Adams); Shidaka coast (Stearns). Some specimens are marked with from two to four radial series of purple-brown blotches.

Tapes vernicosa Gld. Otia Conch., p. 168.

Kagoshima Bay and off Hakodate Cape, 20 fath., coarse sand (Stimp.); Tatiyama (A. Ad.).

Tapes greeffei Dkr. Index, p. 207, pl. 8, f. 15–17.

Kagoshima (Dkr.).

Tapes semirugata Phil. Abbild., III, p. 76, pl. 7, f. 4.

Near Sakai, Inland Sea (Stearns).

Tapes punctata Chemnitz.

Japan (Stearns). Several specimens agreeing well with Reeve's fig. 16*a* ("*radiata*").

Tapes philippinarum Adams & Reeve. Ad. & Rv., Voy. Samarang, pl. 22, f. 10; Lischke, Jap. Meeres-Conch., III, pl. 5, f. 17-20

Bay of Yedo (Lischke); coast from Tokyo to Ojima (Stearns); Seta coast (Stearns); Nagasaki, Hakodate (Lischke).

Some specimens agree well in color with the figure in the Samarang Zoology; others show lines and zigzags. The typical form is deep purple in the pallial sinus and its vicinity. The var. *ducalis* Roemer, is entirely white within. Lischke does not recognize Roemer's form as distinct.

Tapes variegatus Hanley. Thes., II, p. 696, pl. 151, f. 133–138.

Yedo, Nagasaki (Lischke).

Tapes bruguieri Hanley. Kino-o-Shima (Ad.).

Saxidomus purpuratus Desh.

Yedo (Lischke); Hakodate (Schrenck); Seto-Uchi, Mososeki (A. Ad.); Tokyo Harbor (Stearns).

Gomphina donacina Chemnitz. Conchyl. Cab., p. 185, pl. 23, f. 1, 2.

Nagasaki (Lischke).

Gomphina melanaegis Roemer. Novit. Conch., p. 40, pl. 12, f. 12, 13; Jap. Meeres-Conch., III, pl. 7, f. 10, 11.

Inland Sea (Stearns); Bay of Yedo (Lischke).

Gemma gemma Totten. Aniwa Bay (A. Ad.).

(*Isocardiacea*).

ISOCARDIIDÆ.

Isocardia tetragona Ads. & Rve. Zool. Samarang, p. 76, pl. 22, f. 1.

Japan Sea.

Isocardia moltkiana Chemn. Ibid, pl. 22, f. 3.

Corea Strait.

(*Tridacnacea*).

TRIDACNIDÆ.

Hippopus maculatus Linn. S. Japan (Stearns).

Tridacna squamosa Lam. Ohosaka, Hiogo (Lischke).

(*Cardiacea*).

CARDIIDÆ.

Cardium burchardi Dkr. Index, p. 210, pl. 18, f. 4–6.

Sagami (Dkr.).

Cardium californiense Desh. Mal. Ross., p. 40, pl. 15, f. 23–25.

E. coast, Tokyo to Ojima (Stearns); Hakodate (Lischke).

Cardium arenicola Reeve. C. Icon., f. 78.

Nagasaki (Lischke).

Cardium exasperatum Sowb. C. Icon., f. 107.

Japan (Dkr.).

Cardium modestum Ads. & Rve. Zool. Samarang, p. 77, pl. 22, f. 6.

Cardium muticum Reeve. Reeve, Conch. Icon., II, f. 32; Dkr., Moll. Jap., pl. 3, f. 16 (*japonicum*).

Tokyo Harbor (Stearns); Nagasaki, Yedo (Lischke); Deshima (Dkr.); Hakodate (Schrenck).

Cardium papyraceum Chemn. Conchyl. Cab., p. 78, pl. 3, f. 4, and pl. 12, f. 19, 20.

Nagasaki, Tokyo, Hakodate.

Cardium apertum Chemn. J. M. C., II, p. 173; III, p. 106.

Bay of Yedo (Lischke).

Cardium liratum Sowb. Dkr., Index, p. 212. Japan (Dkr.).

Cardium retusum Linné. C. Icon., II, f. 103. Japan (Dkr.).

Cardium groenlandicum Chem. Tartary Strait (Lindholm).

Cardium beechei Ads. & Rve. Index, p. 212, pl. 15 f. 1–3.

Japan (Dkr.).

(*Leptonacea*).

GALEOMMIDÆ.

Scintilla thoracica Gld. Otia Conch., p. 174.

Oushima (Stimpson).

Galeomma japonicum A. Ad. Ann. Mag., 1862, p. 228.

Mino-Shima, 63 fms. (Ad.).

LEPTONIDÆ.

Kellia pumila S. Wood. Journ. Linn. Soc., XIV, p. 421.

Corea Strait (St. John).

Kellia subsinuata Lischke. J. M. C., II, p. 136, pl. X, f. 1–3.

Nagasaki (Lischke).

Kellia undulata Gld. Otia Conch., p. 173.

Kagoshima (Stimpson).

Kellia japonica n. sp. Pl. III, figs. 18, 19.

Shell quadrate-rounded, subequilateral, inflated, olive-straw colored around the basal and end margins, becoming corneous on the convexity and beaks, this portion dark bluish-brown when the soft parts are dried in. Surface shining, with delicate growth-striæ. Beaks rather prominent, contiguous, slightly anterior; hinge and basal margins slightly curved. Interior white, bluish in the cavity. Teeth as in *K. laperousii* but rather stronger, the cardinals squarer, the posterior lamella strong, short, high and triangular. Length 12, alt. 10·5, diam. 6·5 mm.

Japan (F. Stearns).

It is less elongated than the nearly allied *K. laperousii* with less oblique cardinal teeth.

Montacuta divaricata Gld. Otia Conch., p. 173.

Hakodate, on the spines of a Spatangus (Stimpson).

Lasea rubra Mont. Journ. Linn. Soc., XIV, p. 420.

Corea Strait (St. John); Nagasaki (Lischke).

Lepton subrotundum Dkr. Index, p. 219, pl. 14, f. 12, 13.

Tokyo (Dkr.).

Lepton japonicum A. Ad. Ann. Mag., 1862, p. 228.

Tabu Shima (Ad.).

Lepton sulcatulum Jeffreys. Journ. Linn. Soc. Zool., XIV, p. 420.

Corea Strait (St. John).

Thecodonta sieboldi A. Ad. Ann. Mag., 1864, p. 309.

Goto Is. (A. Ad.).

(*Lucinacea*).

DIPLODONTIDÆ.

Diplodonta semiaspera Phil. Archiv, f. Naturg., I, 1836, p. 225, pl. 7, f. 2.

Nagasaki (Dkr.). *Lucina orbella* Gld. which Dkr. quotes as a synonym is a totally distinct *Diplodonta*. Probably Dunker's shells are the same as the following species. Lischke quotes *D. orbella* from Nagasaki, Bay of Yedo and Yokohama.

Diplodonta (?semiaspera var.) japonica. Pl. III, figs. 6, 7.

Anterior end more produced and more narrowly rounded than in *semiaspera;* hinge straighter, narrower; anterior half (or less) of

valves and a small posterior segment concentrically costulate, the rest having the costulæ interrupted into long granules; no lunule. Length 17⅓, breadth 15½, diam. 13½ mm., sometimes larger.

9 specimens collected by Mr. Stearns in Japan, exact locality unknown.

Diplodonta (Mysia) figlina Gld. Otia Conch., p. 171.

E. coast Japan, Lat. 37°, in coarse black sand, 20 fath. (Stimp.).

Diplodonta (Felania) usta Gld. Otia Conch., p. 170.

Hakodate Bay, 8 fath., sandy mud (Stimpson).

Axinus japonicus A. Ad. Ann. Mag., 1862, p. 227 (*Cryptodon*).

Okosiri (Ad.).

Axinus oblongus, plicatus A. Ad. *Ibid.* Mino-Shima (Ad.).

Axinus flexuosus Mont. Corea Strait (St. John).

Axinus suborbicularis A. Ad.

LUCINIDÆ.

Lucina contraria Dkr. Index, p. 215, pl. 13, f. 12–14.

Tokyo (Dkr.).

Lucina divergens Phil. Abbild., III, p. 103, pl. 2, f. 4. (*L. fibula* A. & R., Zool. Samarang, pl. 24, f. 5, *teste* Dkr.).

Deshima (Dkr.); Nagasaki (Lischke).

Lucina parvula Gld. Otia Conch., p. 174.

Hakodate, 6–20 fath., sand (Stimp.).

Lucina pisidium Dkr. Moll. Jap., p, 28, pl. 3, f. 9.

Deshima (Dkr.); Nagasaki (Lischke). Stearns collected larger specimens, 8½x8⅓ mm. at Tokyo Harbor. It does not seem to differ from *L. parvula* Gld. of which one of the original specimens is before me.

Lucina quadrisulcata d'Orbigny (?). Tartary Strait (Dkr.).

Lucina corrugata Dkr. Index, p. 216, pl. 8, f. 9–11.

Inland Sea (Dkr.).

Loripes philippiana Reeve. C. Icon., *Lucina*, f. 23 (*Venus edentula* L., of Phil. and Dkr.).

Loripes bialata n. sp. Pl. III, figs. 13, 14.

Shell resembling the West Indian *L. edentula*, but thinner, more ventricose, beaks larger above the hinge-line, hinge straighter, the ligament-plate much shorter and narrower. Dorsally the valves

are more produced at each end, and the posterior dorsal angle especially is more produced and squarer than in *edentula*. Outside with irregular growth-striæ and traces of low radii, covered around the edges with a thin, caducious light brown cuticle. Interior dead white, sparsely asperulate in the cavity; muscle impressions as in *edentula*, but pallial line further removed from ventral edge of valves. Length 56½, alt. 51, diam. 34½ mm.

Inland Sea (F. Stearns, two specimens).

These shells are far more equilateral than *L. philippiana* Reeve, with less sinuous hinge line, slighter ligament plate, etc. The same characters distinguish it from *L. schrammi* Crosse, Journ. de Conch., 1878, p. 328.

Myrtæa gibba, lamellata A. Ad. Ann. Mag., 1862, p. 225.

Tsu-Shima (A. Ad.).

Myrtæa fimbriatula, obesula, decussata A. Ad. *Ibid.* Tabu-Shima (Ad.).

Myrtæa plicatula, circinata, delicatula A. Ad. *Ibid.* Mino-Shima, Strait of Corea (Ad.).

(*Chamacea*).

CHAMIDÆ.

Chama imbricata Broderip. Lischke, J. M. C., II, pl. 9, f. 4.

Nagasaki (Lischke).

Chama ambigua Lischke. *Ibid*, p. 128, pl. 8, f. 2.

Nagasaki (Lischke).

Chama semipurpurata Lischke. J. M. C., II, pl. 8, f. 1.

Nagasaki (Lischke). One specimen collected by Stearns.

Chama dunkeri Lischke. J. M. C., II, p. 128, pl. 8, f. 3, 4.

Nagasaki (Lischke). One specimen collected by Stearns.

Chama retroversa Lischke. J. M. C., II, pl. 9, f. 1–3.

Nagasaki (Lischke). Numerous specimens of this well marked species were collected by Mr. Stearns.

Chama aspersa Reeve. C. Icon., f. 24. Japan (Rein).

(*Carditacea*).

CARDITIDÆ.

Cardita cumingiana Dkr. Dkr., Moll. Jap., p. 29, pl. 3, f. 18.

Yokohama and Loochoo Is. (Stearns); Deshima, Nagasaki and Tokyo (Dkr. and Lischke).

Cardita leana Dkr. (Moll. Jap., pl. 3, f. 17) seems to be only a variation of the same species. Specimens attain a length of 34 mm.

Cardita variegata Brug.

Yokohama (Stearns). A single typical specimen.

Cardita pica Reeve. Conchyl. Cab., p. 39, pl. 8, f. 13–14.

Nagasaki (Lischke).

Cardita vestita Deshayes. Conchyl. Cab., p. 32, pl. 12, f. 8–9.

Japan.

Cardita ferruginea Adams. Conchyl. Cab., p. 17, pl. 6, f. 11.

Japan.

(*Astartacea*).

CRASSATELLITIDÆ.

(*Crassatellites* Con.=*Crassatella* Lam. 1801, not 1799).

Crassatellites japonica Dunker. Index, p. 220.

Japan.

Crassatellites compressa Ads. & Rve. Zool. Samarang, pl. 23, f. 10.

Corean Archipelago.

Crassatellites corrugata Adams & Reeve. Conchyl. Cab., p. 27, pl. 8, f. 5.

Japan (Paetel coll.).

Crassatellites heteroglypta n. n.

Crassatella japonica Sby. (not Dkr.), Jour. Linn. Soc., XX, p. 399, pl. 25, f. 19.

Japan (Sowb.).

Crassatellites sublamellata Weinkauff. Conchyl. Cab., p. 25, pl. 7, f. 11.

Japan.

(*Cypricardiacea*).

PLEUROPHORIDÆ.

Trapezium vellicatum Reeve. C. Icon. I, f. 7.

Nagasaki (Lischke).

Trapezium rostratum Lam. *Ibid*, f. 3.

Tsu-Shima, in oyster shells (Ad.).

Trapezium angulatum Lam. *Ibid*, f. 2.

Okino-Shima (Ad.), in Madrepore.

Trapezium liratum Reeve. C. Icon., I, pl. 1, f. 1 (*Cypricardia*).

Awa, Bishiu (Stearns), numerous specimens; Bay of Yedo (Lischke).

Coralliophaga coralliophaga Chemn. Nagasaki (Lischke).

Order ANOMALODESMACEA.

(*Poromyacea*).

CUSPIDARIIDÆ.

Cuspidaria elegans Hinds. Zool. Samarang, p. 84, pl. 23, f. 4 (*Nærra moluccana*).

Mino-Shima (A. Ad.).

Cuspidaria nobilis A. Ad. Ann. Mag. N. H., 1868, p. 366.

Mino-Shima (A. Ad.).

Cuspidaria hindsiana A. Ad. Ibid. Goto Is. (Ad.).

Cuspidaria nasuta A. Ad. Ibid. Satanomosaki (Ad.).

Cuspidaria (Rhinomya) philippinensis Hinds. Ann. Mag., 1868, p. 367.

Uraga; Kino-o-Shima (A. Ad.).

Cuspidaria (Rhinomya) rugata A. Ad. *Ibid.* Tabu-Shima (Ad.).

Cuspidaria (Cardiomya) gouldiana Hinds. *Ibid.* Uraga, Goto, Tsu-Shima (Ad.).

Cuspidaria nitida A. Ad. & Rve. Zool. Samarang, p. 83, pl. 23, f. 3.

Japan (Dkr.).

Cuspidaria (Myonera) lischkei E. A. Smith. P. Z. S., 1891, p. 438, pl. 34, f. 6.

South of Japan, 1875 fathoms (Challenger).

Leiomya adunca Gld. Otia Conch., p. 162.

Kagoshima Bay (Stimpson); Seto-Uchi, Hakodate (A. Ad.).

VERTICORDIIDÆ.

Verticordia japonica A. Ad. Ann. Mag., 1862, p. 224.

Goto Is. (A. Ad.).

Verticordia multicostata A. Ad. *Ibid.*

(*Ensiphonacea*).

CLAVAGELLIDÆ.

Clavagella ramosa Dkr. Index, p. 172, pl. 16, fig. 1.

Japan (Dkr.).

Aspergillum giganteum Sowerby. Pl. III, fig. 1.

Valves large, irregularly oblong-trapezoidal, dilated toward the posterior end, very coarsely and irregularly concentrically corruga-

ted, and showing under the lens a very fine, irregular wrinkling; standing at an angle to each other of about 100°. Tube rough and sparsely covered with coarse sand and shells, swollen anteriorly, contracted behind the valves. Anterior end forming a mass of irregularly placed short tubes, among which pebbles, etc., are imbedded, and lacking any trace of a marginal fringe or rosette. Posterior end slightly larger than median part of tube, bearing two flounces. Total length 285 mm., diameter of median part of tube 27, diameter of tube at valves 50, diameter of tubule mass 55. Valves, antero-posterior length 27 mm., dorso-ventral 16 mm.

Found at village of Goshoura, district of Amakusa, coast of Prov. Higo, (Kumamoto Keu) Japan. The original locality was simply Japan. Native name, *Teppo-Kai* (Gun shell).

This specimen was procured by Mr. Frederick Stearns at the Third National Exhibition, Tokyo, 1890. It is evidently nearest allied to *A. incertum* Chenu (Ill. Conch., I, pl. 4, f. 5, 6) but differs in the totally diverse shape of the valves, which are triangular and broader than long in that species, oblong and far longer than wide in this. Mr. Sowerby's specimen (see P. Z. S., 1888, p. 290) was larger, length 325 mm., and had 6–7 flounces. The species has not before been figured.

What Dunker reports as fragments of a gigantic specimen of *A. vaginiferum*, is probably this species.

(*Anatinacea*).

LYONSIIDÆ.

Lyonsia ventricosa Gld. Otia, p. 162. *Lyonsia rostrata* Lischke. Jap. M. C., III, p. 102, pl. 9, f. 13.

Hakodate (Stimp.); southern coast of Japan (Lischke). An original specimen of Gould's species before me seems practically identical with that of Lischke. The examples collected by Mr. Stearns are larger than Lischke indicates (length 23 mm.) and more abruptly truncated posteriorly.

Lyonsia prætenuis Dkr. Index, p. 180, pl. 7, f. 13.

Wakayama, Inland Sea (Dkr.).

Entodesma navicula Ads. & Rve. Zool. Samarang, p. 83, pl. 23, f. 11.

Kiushiu Is. (Lischke).

Entodesma truncatissima n. sp. Pl. III, figs. 11, 12.

Shell truncate-oval, very ventricose, thin, light buff, whitish toward the beaks, fragile. Surface with some irregular concentric

wrinkles, the cuticle wrinkled on posterior slope, and showing spaced, inconspicuous radiating cuticular threads toward each end. Anterior extremity abruptly truncated; posterior extremity rounded, slightly gaping. Interior white; lithodesma large.

Length 24, alt. 14, diam. 11 mm.

Length 19, alt. 11½, diam. 11 mm.

Nemoto and Amatsu, Boshiu, Hakodate (Stearns).

These shells are more abruptly truncated anteriorly than specimens of *Lyonsia navicula* before me, and they differ in the same way from *Entodesma saxicola* of the same size. The lithodesma is as in *E. saxicola*.

PANDORIDÆ.

Pandora delicatula A. Ad. Conch. Icon., XIX, pl. 3, f. 17.

Japan (Adams).

MYOCHAMIDÆ.

Myodora triangularis A. Ad. Dkr., Index, p. 181, pl. 7, f. 11, 12.

Myodora fluctuosa Gld. Otia, p. 161; Smith., P. Z. S., 1880, p. 583.

Kagoshima Bay (Stimp.).

THRACIIDÆ.

Thracia pusilla Gld. Otia Conch., p. 161.

Simoda (Stimpson).

Thracia concinna Gld. Otia Conch., p. 161.

Kagoshima Bay (Stimpson).

ANATINIDÆ.

Anatina japonica Lischke. Jap. Meeres-Conch., III, p. 101, pl. 9, f. 7–10.

Bay of Yedo (Lischke); Yokohama (Stearns).

Anatina flexuosa Reeve. Rve., Conch. Icon., XIV, pl. 1, f. 5.

Japan (Reeve).

Anatina limicola Reeve. Rve., Conch. Icon., XIV, pl. 4, f. 27.

Japan (Reeve).

Anatina kamakurana n. sp. Pl. III, figs. 2, 3.

Shell elongated, rather ventricose, gaping at both ends, irregularly wrinkle-striate and minutely granulated as usual, fragile; posterior end longer than the anterior and narrower, rounded, moderately gaping; anterior end broadly rounded, but slightly gaping; dorsal margin nearly parallel with the basal, but rising in front of the

beaks, straight behind them; beaks split; chondrophore small, its posterior butress curved, very oblique. Length 42½, alt. 19, diam. 14 mm.

Kamakura (Stearns).

Order PRIONODESMACEA.

(*Mytilacea*).

MYTILIDÆ.

Mytilus crassitesta Lischke. J. M. C., I, p. 151, pl. 11, f. 1, 2.

Akashi coast (Stearns).

Mytilus giganteus Holmberg. Bull. Soc. Imp. Nat. Moscou, 1862, p. 422, pl. 11, 12.

Inland Sea (Stearns); Nagasaki (Lischke).

Mytilus grayanus Dkr. Dkr., Index, p. 221; cf. Lischke, J. M. C., I, p. 153, pl. 10, f. 7, 8.

Hakodate (Phila. Acad. coll. and Stearns). This may be Gould's *M. coruscus*.

Mytilus hirsutus Lamarck. Conchyl. Cab., p. 40, pl. 7, f. 6.

Inland Sea (Stearns); Nagasaki (Lischke).

Mytilus sinuatus Dunker. Conchyl. Cab., p. 76, pl. 17, f. 7.

Japan (Dunker); Inland Sea (Stearns).

Mytilus curvatus Dunker. Conchyl. Cab., p. 34, pl. 14, f. 7, 8.

Japan (Dkr.).

Mytilus atratus Lischke. Jap. Meeres-Conch., II, p. 146, pl. 10, f. 45; *Modiola aterrima* Dall, A. J. C., VII, p. 154.

Nagasaki (Lischke); Bay of Yedo (Dall); S. coast Prov. Ise (Stearns).

Mytilus coruscus Gld. Otia Conch., p. 177.

Hakodate Bay, rocks between tide marks, common (Stimpson).

Mytilus mutabilis Gld. Otia Conch., p. 177.

Kagoshima Bay (Stimpson).

Modiola modiolus Linné. Yedo, Hakodate (Lischke); Inland Sea (Stearns).

Modiola philippinarum Hanley. Rve., Conch. Icon., f. 1.

Nemoto, Boshiu (Stearns).

Several small specimens which seem to agree with this species.

Modiola trailiii Reeve. Conch. Icon., pl. 4, f. 13.

Idzu coast (Stearns).

Modiola metcalfi Hanley. Conchyl. Cab., p. 116, pl. 32, f. 3, 4.
Nagasaki (Lischke).

Modiola nitida Hanley. Conchyl. Cab., p. 111, pl. 31, f. 3.
Tokyo Bay (Lischke); Inland Sea (Stearns).

Modiola hanleyi Dunker. Index, p. 223, pl. 16, f. 3, 4.
Japan (Dunker).

Modiola rhomboidea Hanley. C. Icon., f. 28.
Japan (Dunker).

Modiola flavida Dkr. C. Icon., f. 77.
Japan Sea (Dkr.).

Modiola japonica Dunker. Reeve, Conch. Icon., f. 26.
Hakodate (R. E. C. Stearns); Bay of Yedo (Lischke).

Modiola fortunei Dunker. C. Icon., f. 75.
Japan (Dunker).

Modiola senhausii Reeve. Conch. Icon., f. 22.
Near Enoshima (Stearns); Nagasaki, Bay of Yedo (Lischke).

Modiola arcuatula Hanley. Conchyl. Cab., p. 101, pl. 30, f. 8, 9.
Bay of Yedo (Lischke).

Modiola barbata Linné. Forbes & Hanley, Brit. Moll., VII, p. 190, pl. 44, f. 4.
Japan, off Kobé, in 50 fathoms, sand (Challenger).

Adula californiensis Eschscholtz. Conchyl. Cab., p. 22, pl. 5, f. 19.
Sachalin Is., Japan Sea (Dunker).

Lithophaga curta Lischke. J. M. C., III, p. 111, pl. 9, f. 14–17.
Bay of Yedo, in Madrepores (Lischke); Joga-Shima (Stearns).

Lithophaga aristata Sol. Nagasaki (Lischke).

Lithophaga nasuta Phil. Abbild., II, p. 149, *Modiola*, pl. 1, f. 2.
Nagasaki (Lischke).

Lithophaga zitteliana Dkr. Index, p. 226, pl. 14, f. 1, 2, 8, 9.
Inland Sea (Dkr.).

Modiolaria cumingiana Dunker. Reeve, Conch. Icon., X, *Modiola*, pl. 9, f. 63.
Inland Sea (Stearns).

There seems to be no doubt of the specific identity of S. Australian and Japanese specimens; I have compared examples from Victoria. The *M. impacta* Herm. (=*M. cor* Martyn) is a wider species.

Modiolaria nigra Gray. Bay of Castries (Schrenck).

Modiolaria vernicosa Midd. Bay of Castries (Midd.).

Modiolaria pusio A. Ad. Ann. Mag. N. H., 1862, p. 229.
Mino-Shima (Ad.), on *Haliotis gigantea*.

Modiolaria divaricata Phil. Abbild., III, p. 21, pl. 2, f. 8.
Nagasaki (Lischke).

Modiolaria semigranata Reeve. Lischke, J. M. C., III, p. 110, pl. 9, f. 18, 19.
Tokyo Harbor (Lischke, Stearns).

Modiolaria quadrula Gld. Otia Conch., p. 177.
Kagoshima (Stimpson).

Modiolaria arcuata Gld. Otia Conch., p. 176.
Kagoshima (Stimpson).

Modiolaria cuprea Gld. Otia Conch., p. 175.
Kagoshima (Stimpson).

Crenella decussata Mont. Jeffreys, Linn. Soc. Journ., XIV, p. 419.
Corea Strait (St. John).

Crenella spectabilis, casta A. Ad. Ann. Mag. N. H., 1862, p. 228.
Mino-Shima (A. Ad.).

Crenella cornea A. Ad. *Ibid.* Corea Strait (Ad.).

Crenella crocea A. Ad. *Ibid.* Tsu-Shima (Ad.).

DREISSENSIIDÆ.

Septifer crassus Dunker. Rve., Conch. Icon., X, pl. 7, f. 25. (*Mytilus*).
Japan (Stearns); Hakodate (Schrenck).
Looks externally like *Mytilus hamatus* Say. Dunker and Lischke refer it to *S. virgatus* Wiegmann.

Septifer bilocularis Linné. Nagasaki (Lischke).

Septifer bifurcatus Conr. Japan. (Dkr., Index, p. 228).

(*Anomiacea*).

ANOMIIDÆ.

Anomia ephippium Linné var. (?). Dkr., Index, p. 247.

Anomia radulina A. Ad. Ann. Mag. (3), VIII, p. 142.
Mino-Shima, 63 fms. (Ad.).

Anomia pustulosa A. Ad. *Ibid.* Tabu-Shima, 25 fms. (Ad.).

Anomia laqueata Reeve var. (?). Challenger Lamell, XIII, p. 318.
Japan, off Kobé, in 50 fathoms (Challenger); Hakodate (Schrenck); Joga-Shima coast (Stearns); Yedo (Lischke).

Anomia cytæum Gray. C. Icon., f. 10.

Hakodate (Schrenck); Joga-Shima coast (Stearns). Large, roughly sculptured specimens. Also a single silvery form (var. *argentea*,) thinner, both valves entirely smooth except for slight growth wrinkles.

Anomia elyros Gray. C. Icon., f. 3, 9.

Kii coast (Stearns). Two forms collected; one rather thin with the upper shell orange or yellow, lower shell green, the other heavier, opaque, both valves green.

Placunanomia macroschisma Desh. Abbild., III, p. 132, pl. 1, f. 4.

Yedo, Hakodate.

Placunanomia umbonata Gld. Otia Conch., p. 178.

Kagoshima Bay (Stimpson).

Placenta placenta Linné. (*Anomia*). Japan (Dkr.).

(*Pectenacea*).

LIMIDÆ.

Lima smithi Sowerby. Sowb., P. Z. S., 1888, p. 207, pl. 11, f. 12.

Shell having the general outline and convexity of *L. lima* Linn., thin but strong, slightly gaping anteriorly, entirely closed posteriorly; *beaks situated near the posterior end of the hinge-line; cartilage pit very oblique;* hinge area narrow. Anterior auricles extremely small, posterior auricles moderate, about as in *L. lima*. Surface of valves sculptured with strong rounded radial ribs separated by intervals of about their own width, and *wholly absent on convexity of the valves* from the beaks nearly half the distance to basal margin. Toward the beaks *the surface on each side of the smooth area is densely and finely radially striate, these striæ subsequently uniting by twos or threes to form the coarse ribbing of the later growth.* Ribs at the periphery 39 in number; lacking on auricles and on the concave face of the anterior slope. Dimensions: Height, from beaks to ventral margin 60 mm., length, antero-posteriorly, 46 mm., diameter 25 mm. Collected in Japan by Mr. Frederick Stearns in 1889–'90. Originally described from Japan. Sowerby did not describe the peculiar sculpture in detail, hence the above description.

Lima dunkeri Smith. (*L. japonica* Dkr. not Ad.). Dkr., Index, p. 245, pl. 11, f. 8, 9.

Sea of Japan (Dkr.); Boshiu (Stearns).

Specimens collected at the last named locality much exceed Dunker's type in size, measuring 35 mm. from beaks to lower margin. The species is unusually equilateral for *Lima*.

Lima japonica (A. Ad.) Sowerby, Conch. Icon., XVIII, pl. 5, f. 21 (1872).

Japan (Sowerby).

Lima lima Linné. (*L. squamosa* Lam.).

Yokohama (Stearns); Nagasaki (Lischke).

I can see no difference whatever between the Japanese and Mediterranean specimens of this species, except that the former are larger, measuring as much as 75 mm. from beaks to ventral margin. This species extends eastward in the Pacific to the Viti Islands.

Lima goliath Sowerby. P. Z. S., 1883, p. 30, pl. 7, f. 3.

Japan (Sowerby); S.-E. Nippon, 775 fathoms (Challenger).

SPONDYLIDÆ.

Spondylus regius Linné. Inland Sea (Stearns).

Spondylus sinensis Sowb. Thes., I, p. 427, pl. 87, f. 32–34.

Inland Sea (Stearns); Nagasaki (Lischke).

Spondylus nudus Chemn. *Ibid*, pl. 88, f. 39, 40.

Wakayama, Inland Sea (Dkr.).

Spondylus cruentus Lischke. J. M. C., I, p. 172, pl. 12, f. 1–5.

Nagasaki (Lischke); Sagami (Stearns).

Plicatula cuneata Dkr. Index, p. 246, pl. 11, f. 3.

Japan (Dkr.).

Plicatula muricata A. Ad. *Ibid*, pl. 11, f. 4. Japan (Dkr.).

Plicatula horrida Dkr. *Ibid*, p. 247, pl. 11, f. 6, 7.

Japan (Dkr.).

Plicatula irregularis Dkr. (rugosa Dkr. not Lam.). *Ibid*, p. 247, pl. 11, f. 5.

Japan (Dkr.).

Plicatula simplex Gld. Otia Conch., p. 178.

Kagoshima Bay and Simoda, 5–20 fath. (Stimpson).

PECTENIDÆ.

Pecten crassicostatus Sowerby. Dkr., Index, pl. 13, f. 28+*P. nobilis* Reeve, Conch. Icon., VIII, f. 3.

Ise (Stearns); Yedo, Nagasaki (Lischke).

Pecten squamatus Gmelin. Dkr., Index, p. 240, pl. 11, f. 14.

Sagama Bay (Stearns); Bay of Yedo (Lischke).

Pecten irregularis Sowerby. Dkr., Index, p. 240, pl. 11, f. 2, 15.

Banda and Nemoto, Boshiu, Tsu-Shima (Stearns); Nagasaki (Lischke).

Pecten quadriliratus Lischke. J. M. C., II, p. 158, pl. 9, f. 5, 6.

Nagasaki (Lischke).

Pecten similis Laskey. Journ. Linn. Soc., XIV. Corea Strait (St. John).

Pecten jickelii Dunker. Index, p. 241.

Japan Sea (coll. Löbbecke).

Pecten vesiculosus Dkr. Dkr., Index, p. 241, pl. 11, f. 1.

Japan (Dkr., Stearns).

Pecten tissoti Bernardi. Journ. de Conch., 1858, pl 91, pl. 1, f. 2.

Japan (Dkr.).

Pecten spectabilis Reeve. Dkr., Index, pl. 11, f. 12, 13.

Nagasaki (Lischke).

Pecten lætus Gould. Lischke, Jap. Meeres-Conch., pl. 12, f. 6, 7.

Ikai coast, Joga-Shima, and Sagama Bay (Stearns); Hakodate (Stimp.); Tokyo and Nagasaki (Lischke); Yokohama (Dkr.).

Three main color varieties are included in Mr. Stearns' collection: *A.* Crimson varying to orange; *B.* Royal purple varying to brown; and *C.* Pure white.

Pecten yessoensis Jay. Dkr., Novit. Conch., p. 61, pl. 21; Lischke, Jap. Meeres-Conch., I, pl. 10, f. 34; II, pl. 13.

Hakodate (Stearns, *et al*); Yedo (Lischke).

Pecten plica Linné. C. Icon., VIII, sp. 16.

Nagasaki (Lischke).

Pecten subplicatus Sowb. C. Icon., sp. 17.

Japan (Dkr.).

Pecten vitreus Chemnitz. Conchyl. Cab., VII, f. 637.

Yokohama Harbor, 345 fathoms (Challenger).

Pecten swiftii Bernardi. Journ. de Conch., 1858, p. 90, pl. 1, 2.

Northern Japan (Schrenck).

Pecten asperulatus Adams & Reeve. Zool. Samarang, p. 74, pl. 21, f. 13.

Corea Strait.

Pecten psarus Melvill. Journ. of Conch., V, p. 280, pl. 2, f. 9.

Japan.

Pecten hastingsii Melvill. Journ. of Conch., V, p. 279, pl. 2, f. 7.

Japan (Hastings, Dent).

Pecten mollitus Reeve. C. Icon., sp. 100. Japan.

Amusium japonicum Gmel.

East coast and Inland Sea (Stearns); Yedo and Nagasaki (Lischke).

Amusium obliteratum Linné. Japan (Dkr.).

Amusium pleuronectes Linné. Japan (Dkr.).

Vola laqueata Sowerby. Lischke, J. M. C., II, pl. 12, f. 1, 2; Phil., Abbild., I, pl. 1, f. 1 (*P. antonii*).

Nagasaki Harbor and Yokohama (Stearns); Hakodate (Schrenck); Yedo (Lischke); off Kobé in 50 fathoms; between Is. of Sikoku and Nippon, 50 fathoms (Challenger).

Vola excavata Anton. Phil., Abbild., I, p. 201, pl. 2, f. 1; *Pecten sinensis* Sowb.

Japan (Dkr.).

Vola puncticulata Dkr. Dkr., Index, p. 244, pl. 11, f. 10, 11 (young); Pilsbry, Proc. Acad. Nat. Sci. Phila., 1891, p. 473, pl. XIX, f. 1, 2, 3 (adult).

A single large specimen collected by Mr. Stearns.

Vola inaequivalvis Sowerby. Conchyl. Cab., p. 236, pl. 62, f. 5–8.

South Japan (Dunker).

(*Ostracea*).

OSTRÆIDÆ.

Ostræa gigas Thunberg. Lischke, Jap. Meeres-Conch., I, p. 174 (+*O. laperousii* Schr. and *O. talienwhanensis* Crosse).

Nagasaki (Lischke); Enoshima (Stearns); Yokohama (Mts.); Hakodate (Schrenck); also found on Asiatic mainland.

Only young and moderate sized specimens show the purple color markings outside. One specimen collected is the largest on record, surpassing the measurements given by Thunberg. The length of the ligament area is proportionately greater than in smaller specimens. Measurements of four examples are as follows:

Total length 443 mm.; greatest breadth 95 mm.

Total length 248 mm.; greatest breadth 52 mm.

Total length 246 mm.; greatest breadth 44 mm.

Total length 242 mm.; greatest breadth 44 mm.

All of these are narrow and parallel-sided.

Ostræa denselamellosa Lischke. Lischke, Jap. Meeres-Conch., I, pl. 13, 14.

Hakodate, Tokyo Bay, Yokohama (Stearns); Nagasaki (Lischke). The *O. auriculata* and *O. multicostata* of Sowerby (Conch. Icon., pl. 25) seem to be the same.

Ostræa folium Gmelin. Wakayama (Dkr.).

Ostræa plicata Chemn. Kishiu coast (Stearns).

Ostræa cucullata Born. Mus. Test. Cæs. Vind., pl. 6, f. 11, 12.

Yokohama, E. coast Sagama (Stearns); Nagasaki (Lischke).

I refer to this species a number of small specimens agreeing well with Born's figures.

Ostræa imbricata Lam. Dunker, Index, p. 250; Sowerby, Conch. Icon., XVIII, pl. 17, f. 36 b.

Japan (Stearns, 1890).

Ostræa hyotis Linn.

(Stearns). A single valve of gigantic size, length 235, breadth 190 mm.

Ostræa rivularis Gld. Lischke, J. M. C., III, pl. 14, f. 2, 3.

Nagasaki (Lischke).

(*Pteriacea*).

VULSELLIDÆ.

Vulsella lingulata Linné. Japan (Dkr.).

Vulsella minor Chemn. Japan (Dkr.).

PTERIIDÆ.

(*Pteria* Scop. 1777 = *Avicula* Lam. 1799).

Pteria coturnix Dunker. Index, p. 228, pl. 10, f. 1, 2.

Inland Sea (Dkr.).

Pteria brevialata Dkr. Index, p. 229, pl. 10, f. 3–5.

Inland Sea (Dkr., Stearns).

Pteria loveni Dunker. Index, p. 229, pl. 10, f. 6.

Inland Sea (Dkr.).

Pteria macroptera Lam. Reeve, Conch. Icon., X, pl. 2 and 3.

Keu, Satsuma (Stearns); Prov. of Hizen (Stearns); Kagoshima.

Two very large specimens, one from Satsuma being of the typical *macroptera* form, the other having the short wing and less obliquely extended pearl layer of "*lotorium*." The two measure: *macroptera*, length of hinge-line 225 mm.; oblique length from beak to lower

end 251 mm. Var. "*lotorium*," length of hinge-line 152 mm.; oblique length from beak to lower end 265 mm.

Pteria japonica Dunker. Conchyl. Cab., p. 33, pl. 10, f. 5.

Japan Sea (Dkr.).

Meleagrina martensii Dkr. Index, p. 229, pl. 10, f. 7, 8.

Meleagrina japonica Dunker. Conchyl. Cab., p. 66, pl. 23, f. 2, 3).

Nagasaki (Lischke); S. coast of Kii (Stearns). Girls dive for these shells, which produce numerous pearls.

Meleagrina fucata Gould. Conchyl. Cab., p. 49, pl. 17, f. 2.

Nagasaki.

Malleus albus Chemn. C. Icon., pl. 1, f. 1.

Inland Sea (Stearns); Nagasaki (Lischke).

Malleus regula Forskal. Inland Sea (Dkr.).

Malleus (Malvufundus) irregularis Jousseaume. Le Naturaliste, XVI, 1894, p. 228.

Japan.

PERNIDÆ.

Perna perna Linné. Nagasaki (Lischke, J. M. C., II, p. 153).

Perna costellata Conrad. Hakodate (Schrenck).

PINNIDÆ.

Pinna chemnitzii Hanley. Reeve, Conch. Icon., pl. 1.

Yedo, Nagasaki (Lischke); Kishiu coast (Stearns).

The specimens are narrower than Reeve's figure 1 *b*, and lack the projecting scales along the hinge-margin. Dunker reports *chemnitzii* from Yokohama and Tokyo.

Pinna bicolor Chemn. Conchyl. Cab., VIII, pl. 90, f. 780.

Japan (Dkr.).

Pinna fimbriatula Rve. C. Icon., sp. 63. Japan (Cuming).

Pinna saccata Linné. Japan (Dkr.).

Pinna japonica Hanley. Conchyl. Cab., p. 72, pl. 24, f. 3; pl. 29, f. 1.

Yokohama Bay, Yedo, Nagasaki (Lischke).

Pinna nigrina Lamarck. Rve., Conch. Icon., f. 4, (*P. nigra*).

Tokyo Harbor (Stearns). The largest shell measures, length 365, breadth 240 mm. It is smooth outside except for low radii near the beaks. The smaller specimens are strongly scaled as in Reeve's figure.

Pinna lischkeana Clessin. Conchyl. Cab., p. 73, pl. 28, f. 1.

Yokohama (Rolle coll.); Inland Sea (Stearns); Tokyo Harbor (Stearns).

The smaller specimens collected on the western coast of the Inland Sea agree with Clessin's figure (Conchylien Cabinet, pl. 28, f. 1) except that the hinge-margin is less curved. The specimen figured by Clessin as the adult *P. japonica* (Conchyl. Cab., pl. 29, fig. 1) is in my opinion an adult *lischkeana*. Whether the true *japonica* of Hanley is the same as *P. chemnitzii*, or is the young of *lischkeana*, I am unable to decide. Specimens collected by Stearns in Tokyo Harbor agree with Clessin's figure (pl. 29, fig. 1). They measure, length 375, breadth 204 mm. On the latter half of the shell the prickly rays are wholly absent.

Pinna epica Jouss. Le Naturaliste, XVI, 1894, p. 229.

Japan (Jouss.).

(*Arcacea*).

ARCIDÆ.

Arca navicularis Brug. Dkr., Index, pl. 14, f. 16, 17.

Japan (Dkr.).

Arca acuminata Krauss.

The Japanese shells collected by Stearns seem to constitute a variety, characterized by the less attenuated anterior end, posterior lower angle less produced, the basal margin ascending to it, keel not acute. This may be called var. *subnormalis*.

Arca ocellata Reeve. Conchyl. Cab., p. 87, pl. 24, f. 1–4.

Japan (Smith).

Arca kraussii Phil. Südafrik. Moll., pl. 1, f. 11; Conch. Cab., pl. 35, f. 7, 8; Abbild., III, p. 88, pl. 5, f. 8–10.

E. coast of Japan, Tokyo to Awaji (Stearns); Nagasaki (Lischke).

Arca (Barbatia) obtusa Reeve. Conch. Icon., f. 77 and 80 (*obliquata* Rv. not Gray); *A. decurvata* Lischke, J. M. C., I, p. 148.

Nagasaki, Yedo (Lischke); Inland Sea (Stearns).

Arca (Barbatia) tenebrica Reeve. Conchyl. Cab., p. 156, pl. 39, f. 7, 8.

Nagasaki (Lischke).

Arca stearnsii n. sp. Pl. III, figs. 8, 9, 10.

Shell small, subtrapezoidal, moderately inflated, solid; anterior half white, clouded with flesh color, posterior half fleshy-brown.

Dorsal margin straight and long, angled at each end, basal margin curved, not gaping, posterior end sloping, straight, anterior end rounded; posterior lower angle produced. Surface closely and finely decussated throughout, the radii coarser on posterior slope. Teeth about as in *A. decussata;* area narrow, deep. Interior fleshy with linear brown and whitish radii, and clouded with white, the muscle-scars brown.

Length 16, alt. 9·2, diam. 7 mm.

Length 18, alt. 11, diam. 10 mm.

Nemoto, Boshiu and Yokohama (Stearns).

Hinge much straighter than in *A. tenebrica* Rve., and angled at the ends, the baso-posterior extremity more angular. Sculpture finer than in young *A. decussata*, and less rounded posteriorly.

Arca (Barbatia) decussata Sowerby. Conchyl. Cab., p. 144, pl. 37, f. 2–5.

Nagasaki (Lisckke). Several specimens collected by Stearns.

Arca (Barbatia) domingensis Lam. Conchyl. Cab., p. 195, pl. 47, f. 12.

Nagasaki (Lischke).

Arca (Anomalocardia) granosa Linné. Conchyl. Cab., p. 38, pl. 3, f. 7.

Kodzuka (Stearns); Nagasaki (Lischke).

Arca (Anomalocardia) pulchella Dkr. Novit. Conch., p. 113, pl. 38, f. 6–9.

Japan (Dkr.); East coast of Nippon (Stearns).

Arca (Anomalocardia) inflata Reeve. C. Icon., f. 30; Conchyl. Cab., p. 30, pl. 10, f. 1, 2.

Tokyo Bay (Stearns); Yedo, Nagasaki, Hakodate (Lischke).

Arca (Scapharca) satowi Dkr. Index, p. 233, pl. 9, f. 1–3.

Tokyo.

Arca (Scapharca) subcrenata Lischke. Jap. Meeres-Conch., I, p. 146, pl. 9, f. 1–3 ("*A. nodoso-crenata*" on plate).

Yedo and Nagasaki (Lischke); Inland Sea (Stearns); Itoma Jima I., Loo Choo group (Stearns).

Arca (Scapharca) ambigua Reeve. C. Icon., sp. 65.

Yokohama (Dunker); Nagasaki (Lischke). Mr. Stearns' specimens are all smaller than Reeve's figure of this species.

Arca (Scapharca) japonica Reeve. C. Icon., f. 32; Conchyl. Cab., p. 114, pl. 30, f. 3, 4.

Japan (Siebold).

Arca (Scapharca) troscheli Dkr. Index, p. 234, pl. 14, f. 14, 15.

Japan (Dunker).

Arca (Scapharca) philippiana Dkr. Conchyl. Cab., p. 90, pl. 25, f. 1, 2; (*A. radiata* Rve., C. Icon., f. 40, preoc.).

Japan.

Pectunculus albolineatus Lischke. J. M. C., III, p. 108, pl. 9, f. 11, 12.

Kii coast (Stearns); Yedo (Lischke).

Pectunculus fulguratus Dkr. Index, p. 236, pl. 14, f. 18, 19.

Japan (Dkr.).

Pectunculus rotundus Dkr. Index, p. 236, pl. 16, f. 9, 10.

Bay of Yedo (Dkr.).

Pectunculus vestitus Dkr. Index, p. 236, pl. 16, f. 7, 8.

Pectunculus yessoensis Sowb. P. Z. S., 1888, pl 570, pl. 28, f. 19.

Yesso (Hungerford).

Glomus japonicus E. A. Smith. Challenger Lamell. XIII, p. 325, wood-cut.

Japan, S.-E. of Nippon, in 1875 fathoms.

Nuculina ovata Jeffreys. Journ. Linn. Soc., XIV, p. 418.

Corea Strait (St. John).

Cyrilla sulcata A. Ad. [*Huxleya*]. Journ. de Conchyl., 1868, pl. 4, f. 2.

Near Mino-Shima, 63 fms. (A. Ad.).

Cyrilla decussata A. Ad. Ann. Mag., 1862, p. 295.

LIMOPSIDÆ.

Limopsis woodwardii A. Ad. Dkr., Index, p. 237, pl. 16, f. 5, 6.

Specimens collected by Stearns agree with Dunker's figures in form, but have concentric brown streaks outside and brown pallial line.

Limopsis japonica A. Ad. P. Z. S., 1862, p. 229.

Kuroshima and Kiusu, 26 to 57 fath. (A. Ad.).

Limopsis obliqua A. Ad. P, Z. S., 1862, p. 229.

Uraga, 21 fath. (Ad.)

Limopsis cumingi A. Ad. P. Z. S., 1862, p. 229.

Goto and Santanomosaki, 48 to 55 fathoms.

Limopsis crenata A. Ad. P. Z. S., 1862, p. 230.

Uraga and Satanomosaki, 21 to 55 fathoms.

Limopsis forskalii A. Ad. P. Z. S., 1862, p. 230.

Oshima, Takano-Shima, on the sands, dead.

Limopsis oblonga A. Ad. Ann. Mag., 1860, V, p. 412.

Off Mino-Shima, 63 fms. (Ad.).

Limopsis pelagica E. A. Smith. Challenger Lamell., XIII, p. 22, 254, pl. 18, f. 3, 3a.

Yokohama Harbor, Enoshima, 345 fms. (Chall.).

MACRODONTIDÆ.

Macrodon dalli Smith. Challenger Lamell. p. 269, pl. 17, f. 10.

Off Kobé, 50 fms. (Challenger).

Cucullaea concamerata Martini. Conchyl. Cab., p. 5, pl. 5, f. 1, 2.

Nagasaki (Lischke).

(*Nuculacea*).

LEDIDÆ.

Leda confusa Hanley. Thes., III, p. 119, f. 85.

Japan (Dkr., Stearns); Bay of Yedo (Lischke).

Leda pernuloides A. Ad. Dkr., Index, p. 238.

Yoldia japonica Ads. & Rve. Zool. Samarang, p. 75, pl. 21, f. 9.

Nagasaki.

Yoldia lischkei E. A. Smith. Challenger Lamell., p. 242, pl. 20, f. 4, 4b.

Yokohama Harbor, Enoshima, 345 fathoms (Challenger).

Malletia dunkeri E. A. Smith. Challenger Lamell., XIII, p. 323, wood-cut.

S.-E. Nippon in 1875 fathoms (Challenger).

Sarepta speciosa A. Ad. Journ. de Conch., 1868, pl. 4, f. 1.

Mino-Shima, 63 fms. (Ad.).

NUCULIDÆ.

Nucula paulula A. Ad. P. Z. S., 1856, p. 52.

Japan (Cuming).

Nucula niponica E. A. Smith. Challenger Lamell., XIII, p. 226.

S. of Nippon in 345 fathoms (Challenger).

Nucula (Acila) mirabilis Adams & Reeve. Zool. Samarang, p. 75, pl. 21, f. 8.

Japan, Kiushiu, Nagasaki Bay (Ad. and Rve.); off Kobé in 8 to 50 fathoms (Challenger).

Nucula (Acila) insignis Gld. Otia Conch., p. 175.

E. coast, Lat. 37°, and at Hakodate (Stimpson).

(*Solemyacea*).

SOLEMYIDÆ.

Solemya pusilla Gld. Otia Conch., p. 165.

Hakodate Bay, 5 fath., mud (Stimp.).

Solemya japonica Dkr. Index, p. 220, 261, pl. 14, f. 3.

Japan (Dkr.).

BRACHIOPODA.

TEREBRATULIDÆ.

Terebratula davidsoni A. Ad. Trans. Linn. Soc. (2), IV, p. 9, pl. I, f. 14–16.

Japan, Satanomosaki, 55 fathoms (A. Ad.).

Terebratula (Liothyrina) stearnsii Dall & Pilsbry. Pl. IX, figs. 1, 2, 3. Proc. Acad. Nat. Sci. Phila., 1891, p. 165, pl. 4, f. 1–3.

Province Kii, east coast (Stearns).

Terebratula dalli Dav. Trans. Linn. Soc. (2), IV, p. 17, pl. 2, fig. 23.

Off Japan, near Yedo, 1875 fath. (Challenger).

Terebratulina kiiensis Dall & Pilsbry. Pl. IX, figs. 9, 10. Nautilus, V, p. 18, pl. 1, f. 4, 5.

Coast of Prov. Kii (Stearns).

Terebratulina caput-serpentis Linné. Pl. XI, figs. 5, 6. Trans. Linn. Soc. (2), IV, p. 17, p. 3, fig. 12.

Sagami Bay (Döderlein). The figures are from a West American specimen.

Terebratulina crossii Davidson. Trans. Linn. Soc. (2), IV, p. 33, pl. 3, figs. 4–6.

Sagami Bay (Döderlein); Inland Sea, S. coast of Kii (Stearns).

Terebratulina japonica Sby. Trans. Linn. Soc. (2), IV, p. 34, pl. 3, figs. 7–11.

Sagami Bay (Döderlein); Goto in 48, Tsusalei in 55 fathoms (A. Ad.).

Eudesia raphaelis Dall. Trans. Linn. Soc. (2), IV, p. 58, pl. 11, figs. 11–15.

Near Yedo (Pumpelly); Sagami Bay, 100–200 fathoms (Döderlein).

Eudesia grayi Davidson. Trans. Linn. Soc. (2), IV, p. 54, pl. 10, figs. 1–4.

Hakodate and Mososeki, 7 fath. (Adams).

Terebratella coreanica Ad. & Rve. Trans. Linn. Soc. (2), IV, p. 81, pl. 13, figs. 3–9.

Japan, Hakodate, 7 fath. (A. Ad.); Inland Sea (Stearns).

Terebratella gouldii Dall. Pl. XI, figs. 7, 8.
Proc. Acad. Nat. Sci. Phila., 1891, p. 167, pl. 4, f. 4, 5 (adult); Trans. L. Soc. (2), IV, p. 96, pl. 17, figs. 20–22 (*Megasella* stage).

Hakodate, 60 fath. (Stimpson); E. coast of Japan, between Yedo and Ooshima (Stearns).

Terebratella frontalis Midd. Trans. Linn. Soc. (2), IV, p. 86, pl. 15, figs. 1–8a.

Japan Seas, from low water to 45 fath. (Capt. St. John).

Terebratella mariae A. Ad. Trans. Linn. Soc. (2), IV, p. 89, pl. 15, figs. 13, 14.

Uraga, 21 fath., Goto, 48 fath., Satanomosaki, 55 fath. (A. Ad.).

Terebratella spitzbergensis Dav. Tr. Linn. Soc. (2), IV, p. 83, pl. 16, f. 1–5.

Northern Japan (A. Ad.).

Laqueus blanfordi Dkr. Index, pl. 14, f. 4, 5, 6; Trans. Linn. Soc. (2), IV, p. 83, pl. 15, figs. 9–12.

Wakayama (Dkr.); East coast above Inland Sea (Stearns).

Laqueus rubellus Sby. Trans. Linn. Soc. (2), IV, p. 113, pl. 19, figs. 1–5.

Kuro-Shima, 35 fath. (Adams); Yokohama (Pumpelly); near Jogashima (Stearns).

Laqueus pictus Chem. Trans. Linn. Soc. (2), IV, p. 114, pl. 18, figs. 14–18.

Satanomosaki, 55 fath. (A. Ad.).

Magasella adamsi Dav. Trans. Linn. Soc. (2), IV, p. 96, pl. 17, figs. 18-19.

Inland Sea, Is. of Kuro-puna, 26 fath. (A. Ad.). The adult of this is Eudesia venosa according to Dall.

Ismenia sanguinea Chem. Chall. Rep., Vol. I, p. 20; Conch. Tab., Vol. 8, p. 96, pl. LXXVIII, figs. 1–8.

Mino-Shima, 63 fms., Goto, 48 fms. (Ad.). Davidson (*l. c.*, p. 179) considers *M. pulchella* Sowb. and *M. reevei* Davidson forms of this species.

RHYNCHONELLIDÆ.

Rhynchonella psittacea Chem. Trans. Linn. Soc. (2), IV, p. 163, pl. 24 figs. 1–11.

Hakodate.

Rhynchonella psittacea var. **woodwardi** A. Ad. Trans. Linn. Soc. (2), p. 168, pl. 24, figs. 12, 13.

Goto, 48 fath., Rifunsiri Is., 35 fath.

Rhynchonella lucida Gld. Trans. Linn. Soc. (2), IV, p. 168, pl. 24, figs. 15, 15b.

Lat. 30° 35′ N., Long. 130° 40′ E., 100 fath., sand (Capt. Stevens of the "Hancock"); Satanomosaki, 55 fath., Goto, 48 fath. (A. Ad.).

Rhynchonella doderleini Dav. Trans. Linn. Soc. (2), IV, p. 172, pl. 25, figs. 14, 15.

Sagami Bay, 160 fath. (Döderlein).

CRANIIDÆ.

Crania japonica Ad. Trans. Linn. Soc. (2), IV, p. 191, pl. 27, figs. 10, 11.

Goto, 71 fath. (Adams).

DISCINIDÆ.

Discinisca stella Gld. Trans. Linn. Soc. (2), IV, p. 204, pl. 26, figs. 27–30.

Seto-Uchi, 17 fath., Isu-Shima, 17–25 fath., Tabu-Shima, 26 fath. (Adams).

LINGULIDÆ.

Lingula anatina Bruguiere. Trans. Linn. Soc. (2), IV, p. 206, pl. 29, figs. 1–8.

Yedo (Adams); Enoshima (Stearns).

Lingula jaspidea Ad. Trans. Linn. Soc. (2), IV, p. 218, pl. 28, figs. 23–24a.

Mososeki, 7 fath., mud (Adams).

Lingula adamsi Dall. Trans. Linn. Soc. (2), IV, p. 218, pl. 28, f. 19.

Tsaulian Harbor, Corean Archipelago, 7 fms. (A. Ad.).

Lingula smaragdina A. Ad. Trans. Linn. Soc. (2), IV, p. 220, pl. 28, fig. 25.

Yobuko, 10 fath., mud.

Lingula lepidula A. Ad. Trans. Linn. Soc. (2), IV, p. 220, pl. 28, fig. 16.

Seto-Uchi, 10 fath., mud (Adams).

APPENDIX I.

List of Land and Freshwater Mollusks collected in Japan by Frederick Stearns.

ENDODONTIDÆ.

Pyramidula (Gonyodiscus) pauper Gld. Tokyo (Stearns).

HELICIDÆ.

Two genera only of *Helicidæ* occur in Japan: EULOTA, represented by the sections *Eulotella*, *Acusta*, *Euhadra*, *Plectotropis* and *Ægista*, and GANESELLA represented by *G. (Satsuma) japonica* and its allies.

From alcoholic specimens collected by Mr. Stearns, the writer has been enabled to figure the anatomy of *Euhadra quæsita, peliomphala, brandti,* etc., *Plectotropis vulgivaga* and *Ganesella japonica* (Man. Conch. [2], IX), and to demonstrate the true relationships of these forms hitherto unknown. By shell characters alone it is at present impossible to classify many of the small Helices of Japan and China. Their anatomy only can decide which species belong to *Ganesella*, which to *Eulota*. Some large forms, such as *Helix largillierti, papilliformis* and *Stearnsii* are of equally dubious affinities. Altogether the Helix fauna is very closely allied to that of middle and northern China, but is poorer in variety of types. The *Euhadra* group is its most characteristic element. *Cathaica, Pseudiberus* and other Chinese *Eulota* sections are absent, as are *Camæna* and *Plectopylis;* and *Moellendorffia*, a group allied to *Helicodonta* in shell features, but possibly belonging near *Chloritis*, is another characteristic type of southern China wanting in Japan.

Eulota similaris var. **stimpsoni** Pfr. Nemoto and Mera, Boshiu, Tokyo, Katsura, Osaka (Stearns).

Eulota sieboldiana Pfr. Kyoto (Gaines); Mera, Boshiu, Yokohama, Tokyo (Stearns).

Eulota laeta Gld. Hokkaido (Gaines).

Eulota (Euhadra) luhuana Sowb. var. **nimbosa** Crosse.

Arima (Gaines); Yokohama (Stearns). Bands, indifferently two or three; sometimes the dark bands cover the ground, except for the light flames; and this is the form I have called var. *subatra.* Others occur at Yokohama without dark bands, but with the papery streaks.

Eulota (Euhadra) luhuana var. **eoa** Crosse. Yokohama (Stearns).

Eulota (Euhadra) luhuana var. **brandti** Kob. Nikko (Stearns).

Eulota (Euhadra) luhuana var. **nipponensis** Kob.

Kyoto; both the plain and a two-banded form collected by Mr. Stearns. Lip indifferently purplish-fleshy or white.

Eulota (Euhadra) luhuana var. **amaliæ** Kob.

Japan (Stearns).

Eulota (Euhadra) luhuana var. **senckenbergiana** Kob. Mt. Hie, Hiezan (Gaines)

Eulota (Euhadra) quæsita Desh. Near Yokohama.

Eulota (Euhadra) quæsita var. **perryi** Jay. Nikko (Stearns).

Eulota (Euhadra) blakeana Newcomb. Pl. I, figs. 3, 7, 8, 8.

Helix blakeana Newc., Proc. Cal. Acad., III, p. 179, (1865); not *H. blakeana* Tate, 1870, = *Thysanophora tatei* Pils., 1895.

Helix (*Aegista*) *blakei* Kobelt, Faun. Jap., p. 23, pl. 7, f. 10, 11.

Helix (*Eulota?*) *blakei* Kobelt, Conchyl. Cab., p. 673, pl. 192, f. 9, 10.

The type lot of this species is preserved in the museum of Cornell University, and consist of three specimens: the type drawn on pl. I, figs. 7, 8, 8; a smaller specimen broken above, pl. I, fig. 3; and a young shell.

The larger shell is slightly abnormal in having the last whorl deeply descending on its last half, owing to a slight fracture. There are 6 whorls, the earlier two forming the nepionic nucleus, apex obtuse; those following are convex, with moderately deep sutures, showing slight growth wrinkles and close minute spiral, wavy impressed lines, which are well developed over the whole surface, and not different from those of *E. peliomphala* in fineness and spacing. Umbilicus moderate, about one-eleventh the diameter of the shell, rather more open inside than in *peliomphala*, half covered by the expanded columellar lip. Alt. 19, diam. 28 mm.

The smaller specimen figured differs in the less descending last whorl, less oblique aperture, less covered and larger umbilicus, which is between one-eighth and one-ninth the diam.; alt. —, diam. 26 mm. Both show a very slight, hardly noticeable angulation of the periphery at the origin of the body whorl. The color is a uniform pale corneous-buff, lip white.

The species is very nearly allied to *Eulota peliomphala*, but seems to be specifically distinct. Kobelt misquotes the reference to Cal.

Acad. Proc., as well as the name of this species. We are indebted to Prof. Gilbert H. Harris, of Cornell University Palæontological Department, for the opportunity of figuring these specimens.

Eulota (Aegista?) macrocycloides Kob. Kyoto (Gaines).

Eulota (Aegista) kobensis S. & B. Hiesan (Gaines).

Eulota (Plectotropis) vulgivaga S. & B. Yase, near Kyoto (Gaines).

Ganesella stearnsii n. sp. Pl. I, fig. 4.

Shell imperforate, globose-turbinate, higher than wide, thin, straw colored, with a peripheral brown line visible above suture on penultimate whorl; surface smooth to the eye, but under a lens showing very minute crowded spiral lines as in *Eulota nipponensis*, but rather less distinct. Spire high, with convex outlines; whorls 7¼, *very convex*, flattened and arcuate-striatulate below the sutures; the last rounded at periphery, somewhat descending in front; base convex, impressed in the center. Aperture somewhat oblique, semilunar, white within; outer lip arched, slightly expanded, a trifle thickened within; *columella straight, vertical, narrow*, deeply inserted, hardly expanded at the insertion, its edge expanded below, reflexed and closely appressed above in a very thin glaze over the axial region. Alt. 29, diam. 24½ mm.

Mt. Hie, Hiesan, near Kyoto (Gaines).

This is an extraordinary species, recalling *H. sphæroconus* of Formosa and *H. papilliformis* of Nippon. The former is most nearly allied, but differs in the flatter whorls, etc. Kobelt's species has flatter whorls ("*convexiusculi*") and a more slanting columella, etc Whether these species belong with *japonica* Pfr. in *Ganesella*, or are Euhadras allied to *myomphala*, remains to be decided by anatomical research.

The name need not be confused with *Helix stearnsiana* Gabb, a species of *Epiphragmophora*.

Ganesella goodwini Smith. Hiesan (Gaines).

Ganesella japonica Pfr. Kyoto, Kobé (Gaines).

Specimens collected alive by Stearns supplied the anatomical description of this genus in Man. Conch., IX.

PUPIDÆ.

The species of Clausilia collected have not yet been all identified, and will be treated of elsewhere.

SUCCINEIDÆ.

Succinea lauta Gld. Hakodate, Hokaido (Stearns).

AURICULIDÆ.

Melampus luteus Q. & G.

Numerous specimens brought from Japan by Mr. Stearns, but probably imported.

LIMNÆIDÆ.

Limnæa japonica Jay. Hakodate (Stearns).

Limnæa goodwinii Smith. Tokyo, Hakodate, Shimnosiki (Stearns).

This probably is identical with *L. pervia* Mts.

Planorbis spirillus Gld. Kishiu (Stearns).

OPERCULATA.

Cœlopoma japonicum A. Ad. Kobé, (Gaines).

Cyclotus campanulatus Mart. Kobé (Gaines).

Cyclophorus herklotsi Mart. Hiezan (Gaines).

Pupinella rufa Sowb. Kobé.

Helicina japonica A. Ad. Large var. Hiezen (Gaines).

VIVIPARIDÆ.

Vivipara stelmaphora Bgt. var. **malleata** Reeve. Heda coast and Mera, Prov. Boshiu, washed up on the beach (Stearns).

Vivipara sclateri Ffld. With the preceding.

Vivipara oxytropis Bens. Tokyo (Stearns).

MELANIIDÆ.

For literature of Japanese *Melaniidæ* see Boettger, Nachr. D. M. Ges., 1886, p. 1, and Brot, Recueil Zool. Suisse, IV, p. 105.

Melania japonica Reeve. Shimosa, Yokohama (small form), Kishiu (young only), Nikko. (Stearns).

Melania multigranosa Bttg. Shimosa. (Stearns).

Melania reiniana Brot. Shimosa. (Stearns).

Melania libertina Gld. Nemoto, Boshiu. (Stearns).

Melania lobbeckei Brot.

Isi. (Stearns). Specimens from this locality are very large, alt. 55–58 mm.

Melania nipponica E. A. Smith. Bungo Sea
Melania dolorosa Gld. Hakodadi.
Melania [illegible] Japan
Melania nigrescens v. Mart. Japan

UNIONIDÆ.

Unio oxyrhynchus Martens. Osaka River (coll. by Gulich); Uji River below Lake Biwa (Gaines).

Unio schlegelii Martens. (Gaines).

CYRENIDÆ.

Corbicula orientalis Desh.

Numerous specimens, collected by Stearns, which I cannot distinguish from the continental form.

Corbicula japonica Prime. (+*biformis* Reinh.).

Yokohamā, on tide-flats (Stearns).

Corbicula straminea Reinh. Mud flats, Kishiu coast (Stearns).

Corbicula martensii Clessin. (+*yokohamensis* Sowb.).

Tokyo (Stearns, in the fish market).

Sphærium heterodon n. sp. Pl. III, figs. 15, 16, 17.

Shell rhombic-oval, anterior end subtruncate-rounded, posterior end truncated, nearly equilateral, moderately convex; light gray, with yellowish ill-defined concentric zones, and usually a darker zone or two. Beaks calyculate; interior bluish-white. Right valve with a single transverse, elongated cardinal in front of the beak; a double short anterior lateral lamella, a single posterior lamella. Left valve with a single minute cardinal, a single short high anterior lamella, posterior lamella double, short. Length $9\frac{1}{3}$, alt. $7\frac{1}{3}$, diam. $5\frac{1}{3}$ mm.

Kishiu, Hizen (Stearns).

The cardinals are extremely minute, almost obsolete. Two specimens have the beak caps conspicuous, a third having them ill-defined.

APPENDIX II.

LIST OF MOLLUSCA IN THE COLLECTION OF FREDERICK STEARNS FROM THE MIDDLE LOO CHOO ISLANDS, WITH DESCRIPTIONS OF NEW SPECIES.

The species listed below were collected for Mr. Stearns by Morizo Seta during 1891, 1892. Part of them were determined by Mr. Stearns, part by Mr. Pilsbry, the latter being indicated by an asterisk (*) following the species names.

In this list the name Yaeyama Jima ("many-peaked island") is used for the largest of the middle Loo Choo group, often known as Okinawa. We believe the same term has also been applied to another island of the group.

A list of mollusks from the middle Loo Choo Is. has been published by Dr. O. Böttger (Nachrichtsblatt des Deutschen Malakozoologischen Gesellschaft, 1892, p. 153). A recent general account of the physical and political features of the group may be found in The Geographical Journal, V, April, May, June (London, 1895) by Professor Basil Hall Chamberlain, of the Imperial University of Japan.

The most remarkable diversity exists in the etymology of the name of these islands, but the form "Loo Choo" or its phonetic equivalent "Luchu" seems preferable for English speaking peoples.

The malacological fauna of this chain of islands seems to be moderately homogeneous as far as known.

ARGONAUTIDÆ.

Argonauta gondola Dillw. Yaeyama.

ACTÆONIDÆ.

Solidula glabra Rve.* Yaeyama.

Bullina scabra Gmel.* Yaeyama.

BULLIDÆ.

Bulla vernicosa Gld. Yaeyama.

17 live shells, col. varieties.

SCAPHANDRIDÆ.

Atys cylindrica Helbling. Yaeyama.

Nat. name *Shira-Kai* (*white shell*). 200 shells, mostly living.

HYDATINIDÆ.

Hydatina physis Lin. 3 shells. Yaeyama.

SIPHONARIIDÆ.

Siphonaria coreensis Ads. & Rve.* Yaeyama.

AURICULIDÆ.

Pythia scarabeus Linn. (?). 1 Shell. Yaeyama.

Melampus caffer Krauss. Yaeyama. Very abundant. Dr. O. Boettger has kindly determined the specimens.

LIMNÆIDÆ.

Limnæa pervia Marts. Yaeyama.

100 live shells (brought home in alcohol with a lot of *Melampus*).

ZONITIDÆ.

Trochomorpha fritzei Boettger.* Pl. X, figs. 9, 10, 11.
Bttg., Nachrbl. D. M. G., 1892, p. 160.

Dr. Boettger's excellent description of this species leaves nothing to be desired. It is remarkable for the acute keel encircling the umbilicus. The specimen figured is from the same island where the types were originally found, Okinawa or Yaeyama; it measures: alt. 6, diam. min. 20, diam. maj. 22 mm., being slightly larger than Boettger's types.

HELICIDÆ.

Ganesella largillierti Philippi.* Pl. X, figs. 12, 13, 14.

Reported by Largilliert from the Loo Choo Is., and also included in Boettger's list. There are three color varieties:

Var. *immaculata* Ad. & Rv. (Pl. X, fig. 12). Pale, almost white above, with a yellowish-green sutural margin and base; apex white. (C. Icon., f. 420).

Var. *eucosmia* Pils. (Pl. X, fig. 14). Body whorl begirt with dark chestnut zones; apex white or pinkish. Conf. Smith, P. Z. S. 1887, p. 317.

Var. *zacosmia* Pils. (Pl. X, fig. 13). Body whorl having a black band immediately above the periphery, fading into rich reddish-chestnut toward the suture; a white or yellow band below periphery, bordered by a black zone below, the middle of the base yellowish-chestnut or reddish-chestnut, apex purple. The coloring of this variety is wonderfully rich for a *Satsuma*.

All of the above varieties collected on Yaeyama Island.

Eulota (Euhadra) yaeyamensis Pilsbry. Pl. IX, figs. 1, 2, 3.

Shell sinistral, perspectively umbilicated, depressed, thin but rather solid, light brown, with a supra-peripheral brown line. Sur-

face irregularly wrinkle-striate, and in places showing an excessively fine, superficial spiral striation. Spire low conoidal, composed of 6 convex, slowly widening whorls, the last nearly twice as wide as the preceding, a trifle descending in front, rounded at the periphery and beneath. Aperture oblique, wide lunate; peristome flesh-tinted, narrowly expanded and subreflexed, and slightly thickened within, dilated at the columellar insertion. Alt. 17, greater diam. 27½, lesser 23 mm.

Yaeyama (Okinawa) Island, Loo Choo group (Frederick Stearns).

This species is apparently most nearly allied to the Chinese *H. latilabris* Mlldff., but the umbilicus is more open, the lip narrower, aperture more oblique, etc. The umbilicus is wider and more open than in *H. quæsita.*

Another specimen is smaller (alt. 15, greater diam. 24, lesser diam. 20½ mm.), and straw-colored, with the usual dark girdle.

Eulota (Euhadra) quæsita Desh. Yaeyama.

Eulota (Euhadra) mercatoria Gray. Pl. X, figs. 1, 2, 3, 4, 5, 6.

Yaeyama I. (Stearns, 29 specimens).

Of this species I believe *H. caliginosa* Adams & Reeve (Voy. Samarang, Moll., p. 62, pl. xvi, fig. 6) to be a synonym. The locality "Mindanao" is, if I am right, probably incorrect. The species shows the same great range of variability that is characteristic of the Japanese Euhadras.

Figure 4 represents a large specimen uniform blackish in color except for slightly marked light bands above and below the periphery.

Figure 6 is the lightest specimen seen, being of a clear yellow tint with a dark line at periphery. It is light below the sutures, like the type of *caliginosa.* Figures 1, 2, 3 represent an average specimen.

Figure 5 is the smallest shell, measuring 17½ mm. diam. It is distinctly carinated in front, as are some other stunted specimens of the lot.

All gradations of form, size and coloring between these selected specimens are represented in the series secured by Mr. Stearns.

Eulota (Euhadra) connivens Pfr.

Yaeyama Island (Stearns).

This species varies from 17½ to 27 mm. in greatest diameter, and shows much mutability in the degree of depression of the spire.

Eulota (Acusta) despecta Gray.* Pl. X, figs 7, 8.

Yaeyama.

The shell varies in color from yellow or straw-colored with nearly white aperture, to purplish-red with fleshy-purple aperture.

Eulota (Aegista) oculus Pfr.* (*typinsana* A. & R.). Yaeyama.

Adult specimens vary from 19 to 27 mm. diameter. They agree well with the figures of *H. typinsana* Adams & Reeve, Zool. 'Samarang,' pl. xv, fig. 3.

Eulota (Aegista) vermis Reeve.* Pl. IX, figs. 7, 8, 9.

Yaeyama (Stearns).

Many examples of this splendid species were obtained. It is notable for the depression of the inner whorls, which are frequently concave.

Eulota (Plectotropis) mackensii Adams & Rve.* Yaeyama.

About 75 specimens of this magnificent species were secured by Mr. Stearns. They are very large, from 34 to 39 mm. diameter, varying in color from light straw-colored or greenish-yellow to dark reddish-chestnut. One of these is figured in Man. Conch. (2), IX pl. 64, fig. 16-17.

Eulota (Plectotropis) elegantissima Pfr.*

Yaeyama, (Stearns, 17 specimens).

Perfectly fresh shells show a fringe of long, delicate hairs at the periphery, and along the suture of the last whorl.

PUPIDÆ.

Clausilia (Stereophædusa) valida Pfr.*

Clausilia (Stereophædusa) Stearnsii Pilsbry. Pl. I, fig. 12.

Shell elongated, regularly tapering, the next to the last and the last whorl widest, the latter hardly contracted below; moderately solid, closely, lightly striated, the striæ wanting on the earlier whorls, more distinct and spaced on the latter part of the last whorl. Color opaque purplish-brown. Whorls 12–13, but slightly convex, separated by a shallow, simple suture. Aperture contained $4\frac{1}{2}$ to $4\frac{5}{6}$ times in length of shell; peristome reflexed, whitish, slightly thickened, not adnate; superior lamella strong, extending to the lip-edge; inferior lamella deep-seated, parallel to the superior, invisible from the front; subcolumellar lamella extending to lip-edge, bounded by grooves; palatal plicæ two, the upper one long, second rather short, with a thin white subvertical lunella below it, which is strengthened below into a low bar.

Alt. 31, greatest diameter of last whorl above aperture 5 mill.

Alt. 26, greatest diameter of last whorl above aperture 5 mill.

Yaeyama (Okinawa), Loo Choo Is. (Fr. Stearns).

Believing this species to be new, I sent examples to Prof. Dr. O. Boettger, the great authority on these shells, and received the following emphatic confirmation of my opinion: "Die *Clausilia* von Okinawa ist *ohne jeden Zweifel* n. sp. Es ist eine *Stereophædusa* und steht in der Mitte zwischen *japonica* Crosse and *brevior* v. Mts."

No similar form has hitherto been reported from the Loo Choo group, the nearest allies of the species being Japanese. It is named in honor of Mr. FREDERICK STEARNS of Detroit, who has contributed so largely to our knowledge of the Japanese fauna. The specimens vary considerable in length, but not in other characters.

TEREBRIDÆ.

Terebra (Subula) maculata Linn. Yaeyama.

Native name, Take-noko-kai (bamboo sprout shell). 1 full grown live shell 7″, with operculum and one each without, 5¾″ and 3″.

Terebra (Subula) muscaria Lam. (var.). Yaeyama. 1 live shell.

Terebra (Subula) muscaria Lam. (Typical).

Native name, Ushi-no-Tsuno, bora (bull's horn shell), 28 live shells. Hirame Jima.

Terebra (Subula) crenulata Linn. Kudaka Is.

Native name, Uno-Tsuna, bora (big rope shell).

Terebra (Subula) dimidiata Lam. Kudaka Is.

Native name, same as previous species; 11 live shells.

CONIDÆ.

Conus marmoreus Linn. Ohon-me Is.

Native name, Bote-furi, bora. 27 live shells, medium and small, the largest 6 cm. long.

Conus imperialis Linn. Yaeyama.

Native name, Nagashi-nani. 4 live shells, 7 cm. long.

Conus vexillum Gml. Itoma Jima.

5 fine live shells, with epidermis, the largest 5¼″ long.

Conus miles Linn. Kobashima.

9 live shells with epidermis, the largest 7 cm. long.

Native name, Imo-Gai (sweet-potato shell).

Conus capitaneus Linn. Kudata.

Native name, Hibi-bora. 1 live shell, 53 mm. long.

Conus geographus Linné.*

Native name, Naga-bai (long shell).

13 mature, fine live shells. Koba-shima Is. Length from 8 cm. to 11 cm.

Conus striatus Linn. Yaeyama Is.

Native name, Nagashi-nani. 15 mature live shells.

Conus tulipa (var. near *C. obscurus* Rve.). 1 live shell. Kudaka Is.

Native name, Hibi-bora.

Conus quercinus Hwass (var.).

Native name, Hibi-bora. 14 live shells, 8 cm. and less. Kudaka Is.

Conus figulinus Linn. Kudaka Is.

1 fine live shell 6 cm., but very much darker in color than the type. Native name, Hibi-bora.

Conus vitulinus Hwass. Nago Is.

1 live shell 39 mm. long.

Conus puncturatus Hwass. Kudaka.

1 live shell 16 mm. long.

Conus lividus Hwass. Oshima Is.

18 live shells with epidermis, the largest 54 mm. long.

Conus hebraeus Linn. Hirame Jima.

3 live shells, the largest 30 mm. long.

Conus pulicarius Hwass.* Ohon-me Is.

1 live shell 6 cm.

Conus literatus Linn. Kobashima. Tryon, Man. Vol. 6, p. 10, pl. 2, fig. 17.

10 shells with epidermis, the largest 13 cm. long.

Conus literatus Linn. var. **millepunctatus** Lam. Kobashima. Try., Man. Vol. 6, p. 10, pl. 2, fig. 19.

14 shells, mostly mature, the largest 82 m. long, with epidermis.

Conus eburneus Hwass. Kudaka Is. Try., Man. Vol. 6, p. 11, pl. 2, fig. 24.

In this specimen the square spots are fewer and more distant. 1 live shell 5 cm. long, without epidermis.

Conus textile Linn. Kaboshima.

9 live shells, the largest 10 cm. long.

Conus aulicus Linn. Kudaka Is.

1 live shell, 9 cm. long.

Conus miliaris Hwass.* Loo Choo Is.

Conus omaria Hwass.* Yaeyama.

OLIVIDÆ.

Oliva irisans Lam. var. **erythrostoma** Lam.

Native name, Naga-Bai (long shell). 26 live shells. Hirame Jima Is.

Oliva irisans Lam. var. **olympiadina** Ducl. (= O. pica Lam.).

1 shell. Yaeyama.

Oliva mustelina Lam. Yaeyama. T., M. Vol. 5, p. 78, pl. 22, figs. 6–14.

3 live shells, slightly varying.

Oliva guttata Lam.* Yaeyama.

HARPIDÆ.

Harpa conoidalis Lam.

Native name, Sho-ko-no-Nishiki (meaning gold brocade shell).
5 live shells, various sizes. Yaeyama.

Harpa minor Rumph. (var.). 2 live shells. Kudaka Is.

Harpa nobilis Lam. 1 live shell. Yaeyama.

MITRIDÆ.

Mitra episcopalis Linn. Tryon, Man. Vol. 4, p. 111, pl. 32, fig. 1.

Yaeyama. Native name, Takenoko-Kai (bamboo sprout shell). 30 shells.

Mitra pontificalis Lam. Tryon, Man. Vol. 4, p. 111, pl. 32, fig. 3.

Yaeyama. Native name, Takenoko-Kai (bamboo sprout shell). 10 live shells.

Mitra (Costellaria) exasperata Gm. Tryon, Man. Vol. 4, p. 180.

Yaeyama. None of the figures given in Tryon are good. 11 live shells.

Mitra (Turricula) corrugata Lam. Tryon, Man. Vol. 4, p. 168, pl. 50, fig. 429.

Yaeyama. 2 live shells.

Mitra (Chrysama) digitalis Chem. Tryon, Man. Vol. 4, p. 149, pl. 44, fig. 278.

Yaeyama. 1 live shell.

Mitra (Scabricola) sphaerulata Mart. Tryon, Man. Vol. 4, p. 122, pl. 39, fig. 149–158.

Yaeyama. 1 live shell.

Mitra (Turricula) taeniata var. **vittata** Swains. (= *M. tayloriana* Sby.) Tryon, Vol. 4, p. 164, pl. 48, figs. 385–388.

Yaeyama. 2 live shells.

Mitra (Turricula) berthæ Sby. Tryon, Man. Vol. 4, p. 168, pl. 49, fig. 417.

Yaeyama. 1 good dead shell.

Mitra (Turricula) plicata Lam. Tryon, Man. Vol. 4, p. 167, pl. 50, fig. 420.

Yaeyama. 1 live shell.

Mitra cardinalis Gmel. Tryon, Man. Vol. 4, p. 111, pl. 32, fig. 4.

Yaeyama. 4 live shells.

Mitra punctículata Lam. Tryon, Man. Vol. 4, p. 115, pl. 33, fig. 25.

Yaeyama. 5 live shells.

Mitra (Mitroidea) telum Sby. (var.). Tryon, Man. Vol. 4, p. 163, pl. 47, fig. 476.

Yaeyama. 2 live shells.

Mitra (Strigatella) literata Lam. var.* Yaeyama.

Mitra (Strigatella) virgata Rve. Tryon, Man. Vol. 4, p. 156, pl. 46, fig. 534.

Yaeyama. 4 live shells.

Mitra (Cylindra) dactylus Linn. Tryon, Man. Vol. 4, p. 197, pl. 57, fig. 658.

Kudaka Is. Native name, Hibi-Bora. 11 live shells.

Mitra (Cylindra) crenulata Gml. Tryon, Man. Vol. 4, p. 197, pl. 57, fig. 666.

Kudaka Is. 1 live shell.

FASCIOLARIIDÆ.

Fusus tuberosus Reeve.* Kudaka Is.

Fusus inconstans Lisch. Tryon, Man. Vol. 3, p. 54, pl. 33, figs. 102–17.

Yaeyama. Native name, Youaki-mōmō (night-crying shell). 10 live shells.

Fusus multicarinatus Lam.

Yaeyama. Native name, same as above. 1 live shell.

Fusus distans Lam. Tryon, Man. Vol. 3, pl. 36, fig. 131.

Yaeyama. Native name, as above. 5 live shells.

Fusus colus Linn. (var.). Tryon, Man. Vol. 3, p. 52, figs. 90–95.

Yaeyama. 1 live shell.

Fusus nicobaricus Lam. (var. near F. laticostatus Desh.).

Hirame Jima Is. 12 live shells.

Fasciolaria filamentosa Lam. Tryon, Man. Vol. 3, p. 75, pl. 59, fig. 9.

Itoma Jima Is. Native name, Yauaki-Gai (night-crying shell). 3 live shells with operculum and 5 without.

Fasciolaria trapezium Lam.

Nago Island. 1 young shell, also 8 full-grown, 3 with opercula and 5 without.

Latirus polygonus Gml. Tryon, Man. Vol. 3, p. 88, pl. 66–67, figs. 106–114.

Hirame Jima Is. 2 live shells.

Lagena smaragdula Linn.* Loo Choo Is.

TURBINELLA.

Turbinella (Vasum) turbinellum Linn. Tryon, Man. Vol. 4, p. 72. figs. 20–22.

Hirame Jima Is. 45 live shells.

Turbinella (Vasum) ceramicum Linn. Tryon, Man. Vol. 4, p. 72, pl. 21, fig. 18.

Hirame Jima Is. Native name, Naga-Bai (long shell). 9 live shells, 1 very large.

Hemifusus ternatanus Gml. (=*Pyrula tuba* Lam.). Tryon, Man. Vol. 3, p. 112, pl. 44, fig. 233.

Kudaka Is. Native name, Uni. 4 live shells.

BUCCINIDÆ.

Siphonalia cassidariformis Rve. = S. ornata and S. conspersa A. Ad.

Yaeyama. 14 live shells.

Siphonalia kelletti Forbes. Tryon, Man. Vol. 3, p. 134, pl. 54, fig. 352.

17 live shells.

Eburna japonica Sby.

Yaeyama. 7 living, but half-grown shells.

Tritonidea undulata Schepm.* Middle Loo Choo Is.

Tritonidea undosa Linn. Yaeyama.

Tritonidea (Cantharus) rubiginosa Reeve.* Loo Choo Is.

NASSIDÆ.

Nassa muricata Quoy & Gaimard (= N. gruneri Rve.). Tryon, Man. Vol. 5, p. 44, pl. 14, fig. 217.

Yaeyama. 2 live shells.

Nassa coronata Brug. Tryon, Man. Vol. 4, p. 23, pl. 7, fig. 8.

Yaeyama. 2 live shells.

Nassa hirta Kiener var.* Yaeyama.

Nassa stigmaria A. Ad. Tryon, Man. Vol. 4, p. 54, pl. 16, fig. 308.

Yaeyama. 4 live shells.

Nassa picta Dkr. var. Tryon, Man. Vol. 4, p. 35, pl. 11, fig. 139.

Yaeyama. 1 live shell.

COLUMBELLIDÆ.

Columbella flava Brug.* Loo Choo Is.

Columbella scripta Lam.* Loo Choo Is.

Columbella (Conidea) discors Gmel.* Yaeyama.

Columbella (Pusiostoma) mendicaria Linn.

Yaeyama. 1 live shell.

MURICIDÆ.

Murex (Chicoreus) ramosus Linn.

Yaeyama. 12 large shells, full-grown, 1 half-grown.

Murex (Chicoreus) brevifrons Lam.

Yaeyama. Found also in many parts of the islands. 21 shells in various stages of growth.

Murex adustus Lam.*

Called Yako-Gai in all parts of the islands.

Murex (Chicoreus) maurus Brod. Tryon, Man. Vol. 2, p. 89, pl. 38, fig. 139.

Yaeyama. 1 shell.

Rapana bezoar Linn.

Kudaka Is. Native name, Ushi-no-tsumo, bora (bull's mouth shell). 1 shell, mature; 1 half-grown.

Purpura persica Linn. var.* Kobashima.

Purpura mancinella Linn.* Loo Choo Is.

Purpura (Thalessa) armigera Chem.

Called in Loo Choo Konpeto-Gai (konpeto meaning sweet-meats). 10 shells.

Purpura (Thalessa) hippocastaneum L., var. **sulcata** Desh.

From Hirame Jima Is. 17 shells.

Iopas sertum Brug. Tryon, Man. Vol. II, p. 180, pl. 55, fig. 189.

Yaeyama. 1 live shell.

Ricinula histrix Lam.

Loo-Choo Is. 8 shells with rather light pink aperture, 10 with darker.

Ricinula horrida Lam.

Yaeyama. Called Ushi-no-guchi, mōmō, meaning bull's mouth shell. 6 with apertures dark purple, 9 with apertures somewhat lighter.

Ricinula arachnoides Lam. = R. ricinus Linn.

Yaeyama. Called Ushi-no-guchi, mōmō, meaning bull's mouth shell. 5 shells.

Sistrum concatenatum Lam.* Loo Choo Is.

TRITONIDÆ.

Triton tritonis Linn. (= T. variegatus Linn.) Tryon, Man. Vol. 3, p. 9, pl. 3–5, figs. 16–25.

Yaeyama. 10 shells, full-grown; 25 smaller (very fine live shells).

Triton nodiferus Lam. Tryon, Man. Vol. 3, p. 10, pl. 1, fig. 3; pl. 3, fig. 417.

Yaeyama. 2 live shells.

Triton (Simpulum) pilearis Linn. (var.) Tryon, Man. Vol. 3, p. 12, pl. 6, figs. 31–36.

Yaeyama. 11 live shells.

Triton (Gutternium) tuberosus Lam.*

Yaeyama. Native name, Ushi-no-hana, bora (bull's nostril shell). 4 live shells.

Triton (Lotorium) clavator Chemn. = T. exilis Rve. Tryon, Man. Vol. 3, p. 21, fig. 86.

Yaeyama. 1 young shell.

Triton (Cymatium) pyrum Linn. Tryon, Man. Vol. 3, p. 19, pl. 11, fig. 79; pl. 10, fig. 76.

Yaeyama. 1 living adult shell.

Ranella (Lampas) bufonia Gmel. (var.). Tryon, Man. Vol. 3, p. 39, pl. 21, fig. 68.

Yaeyama. 7 live shells.

Ranella albivaricosa Rve. Tryon, Man. Vol. 3, p. 38, pl. 18, fig. 6.

Yaeyama. 1 live shell.

Ranella (Lampas) lampas Linn. Tryon, Man. Vol. I, p. 38, pl. 19, fig. 12.

Yaeyama. 5 shells typical. 5 shells with lighter colored aperture, perhaps only older shells.

Ranella (Lampas) granifera Lam. Tryon, Man. Vol. 3, p. 41, pl. 22, fig. 35.

Yaeyama. 1 live shell.

CASSIDIDÆ.

Cassis rufa Linn. Tryon, Man. Vol. 2, p. 273, pl. 3. fig. 57.

Yaeyama. 2 fine live shells.

Cassis glauca Lam. Nago Is.

Var. near *C. coronulata* Sby., except that it is continuously banded longitudinally. 9 live shells.

Cassis vibex Linn. (= C. torquata Rve.) Tryon, Man. Vol. 2, p. 277, pl. 7, fig. 89, 90, 92, 93.

Yaeyama. Native name, Yauaki-Mōmō (night-crying shell). 12 live shells.

Cassis coronulata.

Nago Is. 1 live mature shell.

Oniscia exquisita Ad. Rve. (= O. ponderosa Hanley) Tryon, Man. Vol. 7, p. 282, pl. 8, fig. 100.

Yaeyama. 1 shell.

Dolium perdix Linn. Tryon, Man. Vol. 7, p. 264, pl. 3, fig. 15.

Hirame Jima. Native name, Udsura-gai (quail shell). Also 1 full-grown shell from Yaeyama. 26 shells, $3\frac{1}{2}''$ to $2\frac{3}{4}''$.

Dolium costatum Mke. (var.) Tryon, Man. Vol. 7, p. 263, pl. 4, fig. 19.

Itoma Jima Is. 1 young shell.

Dolium costatum Mke, var. **maculatum** Lam. Tryon, Man. Vol. 7, p. 264, pl. 4, fig. 21.

Itoma Jima Is. Native name, Ki-gai (interest shell). 2 live shells, not adult.

Dolium pomum Linn. Tryon, Man. Vol. 7, p. 265, pl. 5, fig. 26.

Yaeyama. Native name, Ki-gai (interest shell). 10 young shells, 1 to $1\frac{1}{2}$ inch long.

Dolium melanostoma Jay.

Yaeyama. 1 very young shell.

CYPRÆIDÆ.

Cypræa (Luponia) tigris Linn. Tryon, Man. Vol. 7, p. 180, pl. 11, figs. 49–50.

Itoma Jima Is.

Over 100 very fine live shells, which I have separated into no less than 15 well-marked color varieties. They vary from very light cream-color, body sparsely blotched with brownish-black spots, to others which are deeply mottled like tortoise shell.

There are also a number of immature shells of various sizes. These specimens are incomparably finer in polish and lustre than specimens of this species usually imported in bulk, and which are much scratched and without lustre.

Native name, Hibi-bora; Japanese name, Neko-gai (or cat shell).

Cypræa talpa Linn. Tryon, Man. Vol. 7, p. 167, pl. 3, figs. 31–33.

Kudaka Is. 10 fine live shells, 72 mm. and smaller and 3 beach-worn.

Cypræa argus Linn. Tryon, Man. Vol. 7, p. 164, pl. 1, figs. 1–2.

Kudaka Is. 1 very fine live shell, 6 cm.

Cypræa isabella Linn. Tryon, Man. Vol. 7, p. 165, pl. 1, figs. 6–7.

Kudaka Is. 5 fine large shells, 4 poor and bleached.

Cypræa carneola Linn. Tryon, Man. Vol. 7, p. 166, pl. 8, figs. 26–30.

Kudaka Is. 12 fine live shells.

Cypræa (Aricia) caput-serpentis Linn. Tryon, Man. Vol. 7, p. 173, pl. 6, figs. 98, 99, 100.

Kudaka Is. 131 fine live shells. Several varieties of marking.

Cypræa (Aricia) caput-anguis Phil. Tryon, Man. Vol. 7, p. 173, pl. 23, fig. 59.

Kudaka Is. 10 fine live shells.

Cypræa (Aricia) mauritiana Linn. Tryon, Man. Vol. 7, p. 173, pl. 7, figs. 8–11.

Kudaka Is. 31 mature fine live shells, with three styles of varietal marking.

Cypræa (Aricia) arabica Linn. Tryon, Man. Vol. 7, p. 177, pl. 8, fig. 24.

139 fine live shells (typical).

Cypræa (Aricia) annulus Linn. Tryon, Man. Vol. 7, p. 178, pl. 11, figs. 60–61.

Kudaka Is. 33 fine live shells.

Cypræa (Aricia) moneta Linn. Tryon, Man. Vol. 7, p. 177, pl. 10, fig. 40.

Kudaka Is. Light yellow variety. 3 dark bands across the back; 50 fine live shells.

Cypræa (Aricia) moneta Linn.* Tryon, Man. Vol. 7, p. 177, pl. 11, figs. 51–52.

Kudaka Is. Fine deep-yellow variety; 50 fine live shells.

Cypræa (Luponia) vitellus Linn. Tryon, Man. Vol. 7, p. 182, pl. 13, figs. 72–73.

Kudaka Is. 52 fine live shells, with considerable variety in marking.

Cypræa (Luponia) lynx Linn.* Tryon, Man. Vol. 7, p. 183, pl. 14, figs. 86–87.

Kudaka Is. 24 fine live shells.

Cypræa onyx Linné.* Loo Choo Is.

Cypræa (Luponia) errones Linn.* Tryon, Man. Vol. 7, p. 183, pl. 14, fig. 7.

Kudaka Is. 30 live shells.

Cypræa (Luponia) erosa Linn. Tryon, Man. Vol. 7, p. 192, pl. 18, figs. 100–101.

Kudaka Is. 4 live shells.

Cypræa (Luponia) helvola Linn.

Kudaka Is. 2 live shells.

Cypræa (Luponia) asellus Linn.

Kudaka Is. 1 full-grown shell and 3 smaller.

Cypræa cylindrica Born.* Kudaka Is.

Cypræ (Pustularia) staphylea Linn. Tryon, Man. Vol. 7, p. 197, pl. 20, fig. 44.

Kudaka Is. 1 live shell.

Cypræa (Epona) cicercula Linn.

Kudaka Is. Native name, Koyasiu-Kai (little shell). 2 live shells.

OVULIDÆ.

Ovula ovum Linn. Tryon, Man. Vol. 7, p. 246, p. 1, figs. 11–12.

Hirame Jima. 8 fine live shells.

STROMBIDÆ.

Strombus lentiginosus Linn. Tryon, Man. Vol. 7, p. 110, pl. 3, figs. 23–24.

Yaeyama. Native name, Ushi-no-mōmō (bull's nose shell). 31 live shells.

Strombus latissimus Linn. Tryon, Man. Vol. 7, p. 111, pl. 3, fig. 27.

Katsuren Jima. 3 fine live shells.

Strombus costatus Gmel. var. **inermis** Swains. Tryon, Man. Vol. 7, p. 108, pl. 1, fig. 8.

Ohon-me Is. Native name, Yonaki-mōmō (night crying shell). 1 live mature shell, 14 cm. x 8 cm.

Strombus canarium Linn. Tryon, Man. Vol. 7, p. 110, pl. 2, figs. 18–20.

Kobashima. 33 live shells, several varietal markings.

Strombus urceus Linn. var. **sanatellus** Ducl. Tryon, Man. Vol. 7, p. 118, pl. 6, figs. 65, 66, 67.

Kudaka Is. Native name, Hibi-Bora. 30 live shells.

Strombus luhuanus Linn. Tryon, Man. Vol. 7, p. 122, pl. 8, fig. 91.

Kudaka Is. 2 live shells.

Strombus aratrum Martyn* (*pacificus* Swains).

Itoma-Jima Is. Native name, Asagi-Kai. 9 fine live shells.

Strombus aurisdianæ Linn.* Itoma-Jima Is.

Strombus aurisdianæ var. **lævis** Perry.* Itoma-Jima Is.

Pterocera bryonia Gmel. Tryon, Man. Vol. 7, p. 124, pl. 8, fig. 14; pl. 9, fig. 8.

Katsuren Jima Is. 5 shells, 3, 12″ long and 2 younger. Native name, Nanatsu-Maimai (seven horned shell). The Japanese name is Kumo-Gai (or spider-web shell).

Pterocera lambis Linn. Tryon, Man. Vol. 7, p. 124, pl. 8, figs. 1–3.

Katsuren Jima Is. 41 adult shells. Native name, Nanatsu-Maimai (seven-horned shell). Japanese name, Kumo-Gai (or spider-web shell). Also 41 full-grown but not large. Also 17 small or a smaller variety with brilliant dark chocolate cloudings on the back, and 10 young shells, half-grown, with spines just started. Also 50 young shells, without the last spread-whorl or horns.

Pterocera rugosa Sby. Tryon, Man. Vol. 7, p. 126, pl. 10, fig. 12.

Katsuren Jima Is. 35 shells. All adult except 5 young; 2 of the adult shells have very much darker pinkish apertures than the others.

Seraphs terebellum Linné.* Loo Choo Is.

CERITHIIDÆ.

Cerithium nodulosum Brug. Tryon, Man. Vol. 9, p. 122, pl. 20, fig. 15.

Kaboshima Is. 34 live shells, the largest species of the family.

Cerithium echinatum Lam. Tryon, Man. Vol. 9, p. 123, pl. 20, fig. 274.

Kudaka Is. Native name, Chiu-Bora. 7 live mature shells.

Cerithium tuberculatum Linn. Tryon, Man. Vol. 9, p. 133, pl. 24, fig. 25.

Yaeyama. 13 live shells.

Cerithium columna Sby. Tryon, Man. Vol. 9, p. 123, pl. 20, fig. 19.

Yaeyama. 3 live shells.

Cerithium morus var. **moniliferum** Dufresne. Tryon, Man. Vol. 9, p. 133, pl. 24, fig. 35.

Yaeyama. 1 live shell.

Cerithium rubus Mart. Tryon, Man. Vol. 9, p. 131, p. 23, fig. 4.

Yaeyama. 1 shell.

Clava (Vertagus) vertagus Linn. White var. Tryon, Man. Vol. 9, p. 149, pl. 29, fig. 69.

Katsuren Jima. Native name, Shiro-ji-tsu-tan, bora. 14 live shells.

Clava (Vertagus) vertagus Linn. Chestnut-colored var. Fig. 70 of pl. 29.

Katsuren Jima. 7 live shells.

Potamides telescopium Linn. Tryon, Man. Vol. 9, p. 161, pl. 33, fig. 56.

Yaeyama. 2 small shells, 4 cm.

Potamides (Aphanistylus) sinensis Phil. Tryon, Man. Vol. 9, p. 164, pl. 34, fig. 97. Yaeyama Is.

Cerithium morus Lam. var. **rugosum** Wood. Tryon, Man. Vol. 9, p. 134, pl. 24, fig. 47.

Yaeyama. 1 shell.

Cerithium (Liocerithum) piperitum Sby. Tryon, Man. Vol. 9, p. 144, pl. 27, fig. 32.

Yaeyama. 3 shells.

VERMETIDÆ.

Thylacodes dentiferus Lam. (?).* Yaeyama.

Petaloconchus sp. undet.* Loo Choo Is.

Siphonium maximum Sowb.* Yaeyama.

LITTORINIDÆ.

Littorina (Melaraphe) ziczac Chem. (var.). Tryon, Man. Vol. 9, p. 251, pl. 45, figs. 5–7.

Yaeyama. 48 living shells, found with a lot of Melampus.

Littorina littoralis Linn. Tryon, Man. Vol. 9, p. 242, pl. 41, figs. 5–8.

Yaeyama. 10 live shells.

Littorina scabra Linn. var. **filosa** Sby. Tryon, Man. Vol. 9, p. 244, pl. 42, fig. 28.

Yaeyama.

Echinella cumingi Phil.* Yaeyama.

SOLARIIDÆ.

Solarium cingulum Kien.* Nago Is.

Solarium hybridum Linn.* Nago Is.

CYCLOPHORIDÆ.

Cyclophorus turgidus Pfr.*

Miya-Kojima; Yaeyama. The shells from the locality first mentioned above are typical, agreeing well with the figures in the Conchylien Cabinet. The specimens from Yaeyama differ in having the peripheral keel almost, or in some specimens wholly, obsolete.

Leptopoma vitreum Less.* Yaeyama.

Cyclotus taivanus H. Adams.*

Miya Kojima Is. A single specimen, apparently not differing from this Formosan species.

TRUNCATELLIDÆ.

Truncatella valida Pfr. Yaeyama.*

HIPPONYCIDÆ.

Hipponyx australis Quoy.*

NATICIDÆ.

Natica sagraiana Linn. (var.). Tryon, Man. Vol. 8, p. 19, pl. 3, fig. near fig. 45.

Yaeyama. 19 shells, mostly small.

Natica vitellus Linn. Tryon, Man. Vol. 8, p. 29, pl. 8, fig. 60.

Yaeyama. The figure does not fairly represent this species. 5 live shells, 30 mm. long x 27 mm.

Natica chinensis Lam. Tryon, Man. Vol. 8, p. 20, pl. 3, fig. 53.

Yaeyama. 40 shells, mostly young.

Natica adamsiana Dkr. (var.). Tryon, Man. Vol. 8, p. 27.

Yaeyama. Larger and unlike in coloring the typical figure 46, pl. 8. Light olivaceous brown; 6 banded in different shades. Length 37 mm. by 29 mm. width. 8 shells, live and with opercula, 28 dead, without.

Polynices (Mamma) dubia Recl. (var.). Tryon, Man. Vol. 8, p. 47, pl. 16, very near fig. 50.

Kobashima. 10 fine live shells, various stages of growth, without opercula.

Polynices (Mamma) mamilla Linn. Tryon, Man. Vol. 8, p. 49, pl. 16, fig. 46.

Yaeyama. 4 shells.

Polynices (Mamma) aurantia Lam.

Yaeyama. Small, light yellow variety. The callus and umbilicus like fig. 40, pl. 15, Tryon, Man. Vol. 8, p. 42. 110 fine live shells 29 mm. x 22 mm., with opercula; a beautiful and distinct variety.

Polynices (Mamilla) melanostoma Gml. Tryon, Man. Vol. 8, p. 50, pl. 21, fig. 14.

Yona-Guni Is. 17 live shells, the largest 45 mm. x 33 mm.

Polynices flemingianus Recl.*

Sigaretus planulatus Recl. Tryon, Man. Vol. 8, p. 58, pl. 25, figs. 75–77.

Yaeyama. 1 live shell.

IANTHINIDÆ.

Ianthina communis Lam.*

PYRAMIDELLIDÆ.

Pyramidella sulcata A. Ad.

Yaeyama. 6 live shells.

Pyramidella (Otopleura) mitralis A. Ad.*

Yaeyama. 2 live shells.

NERITIDÆ.

Nerita (Odontostoma) polita Linn. Tryon, Man. Vol. 10, p. 30, pl. 6–7.

Yaeyama. Many varieties and coloring. Native name, Tsume-Gai (nail shell). 2000 fine live shells.

Nerita (Odontostoma) picea Recl. Tryon, Man. Vol. 10, p. 33, pl. 9, fig. 52.

Yaeyama. 100 live shells.

Nerita (Odontostoma) ascensionis Chem. (?). Tryon, Man. Vol. 10, p. 31, pl. 7, fig. 27.

The only difference between this shell and the type as figured is that the area is slightly wrinkled.

Nerita albicilla Linn. Tryon, Man. Vol. 10, p. 19, pl. 2, figs. 21–26.

Yaeyama. Several color varieties with opercula. 69 live shells.

Nerita chameleon Linn. var. **squamulata** LeGuillon. Tryon, Man. Vol. 10, p. 20, pl. 2, figs. 34–36.

Yaeyama. 3 shells.

Nerita albicilla Linn. (var.).

Yaeyama. 4 live shells.

Nerita turrita Chem. Tryon, Man. Vol. 10, p. 37, pl. 11, fig. 2.

Yaeyama. 2 live shells.

Nerita (Pila) undata Linn. var. **funiculata** Rve. Tryon, Man. Vol. 10, p. 29, pl. 7, fig. 30.

Yaeyama. 2 shells.

Nerita helicinoides Rve. var. **lævilabris** n. var.* Pl. IV, fig. 32.

Shell obliquely globose-turbinate, multilirate, liræ 18–20 on body-whorl, the lower 3 or 4 nearly obsolete; buff or whitish, encircled by three bands of black variegation alternating with similar rose-dotted zones; on some specimens the black replaced by rose. Spire elevated; last whorl descending, appressed at suture, concave below it. Aperture oblique, outer lip prolonged above, bevelled to an edge inside, margin yellow with dark dots, within this strongly thickened by a white *smooth* callus which is generally subtruncate

or most weakly unidentate above. Area flat, smooth, yellow, the columellar edge with two slight submedian notches. Alt. 13, diam. 13 mm.

Operculum flat, having a closely granulose band around the outer edge, smooth or with very sparse granules in the middle and at proximal end; smoky or blackish-gray except at basal end which is white, a paler streak extending up outer margin. Inside light yellowish proximally, olivaceous distally; flat, rather thin, becoming slightly thicker toward straight margin, but the linear adhesion-scar impressed; spiral process long; basal process rugose or striated.

Yaeyama. 300 specimens.

Differs from *helicinoides* and its synonym *pellis-serpentis* in the completely smooth outer lip; from *affinis* in the coloration, etc.

Nerita hindsii Recl.* Yaeyama.

Nerita undata var. **leguillouana** Recl. Yaeyama.

Neritina ualanensis Less.* Yaeyama.

Neritina (Clithon) sowerbyana Recl. Tryon, Man. Vol. 10, p. 67, pl. 24, fig. 45; pl. 25, figs. 46-51.

Yaeyama. 48 live shells with opercula.

TURBINIDÆ.

Turbo marmoratus Linn. Tryon, Man. Vol. 10, p. 191, pl. 4, fig. 23.

Yaeyama. 12 fine large mature shells with opercula. Native name, Yako-Gai.

Turbo (Batillus) cornutus Gmel. (Typical). Tryon, Man. Vol. 10, p 210, pl. 43, fig. 50.

Kudaka Is. 22 live shells, some with opercula.

Turbo (Batillus) cornutus Gmel. (var.).

Kudaka Is. 25 shells with opercula with but one row of tubercles instead of two as in the type and of smaller size.

Turbo parvulus Phil.* Yaeyama.

Turbo (Senectus) argyrostomus Linn. Tryon, Man. Vol. 10, p. 197, pl. 40, fig. 18.

Katsuren Jima. A var. with no elevated vaulted scales on liræ. 19 live shells with opercula, 9 no opercula; also Kudaka Is. 47 live shells, small size, without vaulted scales on the liræ; with and without opercula; also a var., Kudaka. 2 live shells, full-grown and with opercula, without vaulted scales on the liræ.

Turbo imperialis Gml. Tryon, Man. Vol. 10, p. 192, pl. 43, fig. 53.

Yaeyama. 2 fine mature shells with opercula, more highly nodulated on the body whorl than in the figure.

Turbo petholatus Linn. Tryon, Man. Vol. 10, p. 193, pl. 40, fig. 114.

Yona-Guni Is. Color varieties, 5 shells with opercula and 3 without.

Turbo (Marmorostoma) coronatus Gml. var. **granulatus** Gml. Tryon, Man. Vol. 10, p. 27, pl. 45, fig. 18.

Yaeyama. 150 shells with opercula, some similar to the figure, but *most* of them nodulated. 2 varieties.

Turbo (Marmorostoma) porphyrites Mart. Tryon, Man. Vol. 10, p. 215, pl. 50, fig. 58; pl. 42, fig. 39.

Yaeyama. 2 live shells without opercula.

Astralium (Bolma) modestum Rve. Tryon, Man. Vol. 19, p. 229, pl. 55, figs. 63–64.

Yaeyama. 19 shells. Native name, Ishi-ni-tsiu (stone adhering shell).

TROCHIDÆ.

Trochus niloticus Linn. Tryon, Man. Vol. 11, p. 17, pl. 1, figs. 5–8.

Kobashima Is. 9 live shells with opercula.

Trochus (Cardinalia) nodiferus Lam. Tryon, Man. Vol. 11, p. 22, pl. 3, fig. 18.

Yaeyama. Smaller than the figure. 2 live shells, small var. Native name, Taka-jiri.

Trochus (Cardinalia) triserialis Lam. Tryon, Man. Vol. 11, p. 21, pl. 4, figs. 30–31.

Nago Is. 1 live shell.

Trochus (Infundibulum) radiatus Gml. var. Tryon, Man. Vol. 11, p. 37, pl. 8, figs. 91, 92.

Yona-guni Is. 1 live small shell.

Trochus (Lamprostoma) maculatus Linn. (var.). Tryon, Man. Vol, 11, p. 24, pl. 9, fig. 1.

Ohon-me Is. Native name, Taka-jiri. 10 live shells without opercula.

Trochus (Lamprostoma) tubiferus Kiener. Tryon, Man. Vol. 11, p. 31, pl. 6, figs. 62, 63.

Yona-guni Is. Native name, Yona-guni. 6 live shells, no operculа.

Trochus (Lamprostoma) maculatus var. **gibberula** A. Ad. Tryon, Man. Vol. 11, p. 26, pl. 6, figs. 51–60.

Kobashima Is. 1 live shell.

Umbonium giganteum Less.

Yaeyama. 122 shells, color variety C; of color variety D 27; of color variety E (ater Pilsbry) 38; of color variety F 4; of color variety H 4; of color variety K (new or not before obtained, surface pinkish with brown blotches and clouds) 40 shells.

Umbonium superbum Gld.

Yaeyama. Color varieties. 15 shells.

Ethalia guamense Quoy.*

Chrysostoma paradoxum Born.*

Delphinula delphinula Linné.* Tryon, Man. Vol. 10, p. 266, pl. 67, figs. 1, 2.

Nago Is. 42 mature shells, no opercula. Native name, Fusa-kabe, bora.

STOMATIIDÆ.

Stomatia phymotis Helbling.* Ohon-me Is.

HALIOTIDÆ.

Haliotis gigantea Chemn.

Hirame Jima Is. 4 large and 1 small shell.

Haliotis (Padollus) ovina Chemn.*

Kobashima Is. 16 large shells, and var., 1 shell.

Haliotis (Teinotis) asinina Linn.

Hirame Jima Is. Native name, Awabi, 110 shells.

ACMÆIDÆ.

Acmæa saccharina Linn.* Yaeyama.

PATELLIDÆ.

Helcioniscus nigrosquamatus Rve.*

Yaeyama. 58 live shells. Native name, Senen-gai (may you live a thousand years shell).

Helcioniscus testudinarius Linn.* Yaeyama.

PELECYPODA.

MACTRIDÆ.

Mactra maculata Gmel.* Yaeyama.

Tresus nuttalli Conr.

Yaeyama. 2 large, live shells.

PSAMMOBIIDÆ.

Psammobia elongata Lam.* Yaeyama, Oshima.

Asaphis violacea Forskal.* Kudaka Is.

Asaphis deflorata Linné.* Yaeyama; Kudaka Is.

TELLINIDÆ.

Tellina staurella Lam.*

Yaeyama. Native name, Luna-gai, beach sand-shell.

Tellina staurella Lam. var. **scalaris** Lam.* Kobashima Is.

Tellina virgata L. var. **jubar** Hanley.* Yaeyama.

Tellina scobinata Linn.* Kudaka Is.

Tellina perna Spengler.* Yaeyama.

Tellina rugosa Born.* Yaeyama.

Tellina chloroleuca Lam.*

Yaeyama; Kobashima Is. Native name, Luna-gai, beach sand-shell.

Tellina sp.* Ohon-me Is.

VENERIDÆ.

Venus reticulata Linn.* Yaeyama.

Venus puerpera Linn.* Kobashima Is.; Katsume-Jima.

Venus listeri Gray.* Yaeyama.

Cytherea castrensis Linn.* Yaeyama.

Cytherea (Crista) gibba Linn.* Yona-Guni.

Cytherea (Crista) pectinata Linn.* Kobashima Is.

Cyclina sinensis Gmel.* Yaeyama.

Tapes literata Linn.* Kudaka Is.

Tapes literata var. **punctata** Chemn.* Kudaka Is.

Tapes striata Chemn.* Yaeyama.

TRIDACNIDÆ.

Tridacna squamosa Lam.

Itoma Jima Is. 1 large shell, 13″ long, 8″ broad, 9″ thick. Upon this are are growing 2 *Chama* (sp. undet). Native name, Aji-gai. Such shells are used in the Loo Choos for making domestic utensils.

Tridacna gigas Lam.

Itomo Jima Is. 1 large shell, 13″ long, 9″ broad, 8½″ thick. Native name, Aji-gai.

Tridacna squamosa Lam.

Itoma Jima Is. 13 young shells, 4″ to 3½″ long.

Tridacna crocea Lam. (= T. scapha Meusch.).

Itoma Jima Is. 15 shells, from 5″ in length down to 3½″

Tridacna elongata Lam.

Itoma Jima Is. 26 shells, 1–9″ long, the rest from 6″ down to 3″ in length. Native name, Aji-gai.

Tridacna elongata Lam.

Var. smaller than the type; more elongated and carved at the basal opening. 13 specimens, from 6″ to 3″ long.

Hippopus maculatus Lam.

Itoma Jima. 9 shells, from 6½″ to 4″ long.

CARDIIDÆ.

Cardium flavum Linn.*

Cardium rugosum Lam.* Yaeyama.

Cardium (Serripes) muticum Rve.

Yaeyama. 6 large shells.

Hemicardium cardissa Linn.

Hirame Jima Is. 47 fine live shells, from 7 cm. down to 4 cm. Native name, Avi-gai, so named after the leaf of the Avi plant, which is the crest of the Tycoon.

Hemicardium unedo Linn.* Ohon-me Is.

CORBIDÆ.

Corbis

LUCINIDÆ.

Lucina exasperata Reeve.*

Yaeyama Is., Loo Choo group.

Shell externally like *L. exasperata*, but less compressed, the diameter half the length, with wider lunule. Interior having the surface within the pallial impression most minutely roughened, outside of the pallial impression polished and shining.

Length 80, width 74, diam. 40 mm.

Length 50, width 40½, diam. 24½ mm.

Of this form, two specimens are before us, the smaller one from Okinawa Island (Yaeyama), the larger procured in Japan, locality unknown. The smaller shell is yellow within, with a white border,

the hinge-margin red except the cartilage-pit and the plate below it. The larger specimen is a very faint buff within the pallial line, with a faint pink tint on the hinge.

Lucina interrupta Lam.* Kudaka Is.

Lucina punctata Linn.* Yaeyama.

CHAMIDÆ.

Chama semipurpurata Lischke (?).* Oshima Is.

Chama lazarus Lam.* Kudaka Is.; Oshima Is.

Chama divaricata Rve.* Kudaka Is.; Oshima Is.

CYRENIDÆ.

Corbicula sp. undet.* Yaeyama.

Cyrena fissidens n. sp. Pl. VIII, figs. 5, 6.

Shell resembling *C. sinuosa* as figured by Clessin (Conch. Cab., pl. 45, f. 1), but the posterior lateral tooth and corresponding pit much slender and somewhat longer, the posterior cardinal tooth in right valve split by a sulcus much broader than the space between the posterior and the next adjacent cardinal teeth. Valves orbicular, very convex, lightly wrinkle striate, and covered with a black cuticle. Posterior slope depressed, with a radiating wide and shallow furrow, rendering the margin slightly emarginate. Dorsal, anterior and basal margins well rounded; posterior margin obliquely subtruncate. Length 86, breadth 77, diam. 49 mm.

Yaeyama Is., Loo Choo group. A single specimen collected.

Cyrena luchuana n. sp. Pl. IX, figs. 4, 5.

Shell large, inequilateral, oblong, the anterior end short, broadly rounded, posterior end long, produced, and squarely truncated; basal margin gently arcuate, dorsal margin narrowly rounded at the beaks, the anterior slope short and nearly straight, posterior slope long, rectilinear. Valves strong, convex, the posterior dorsal area flat or concave, bounded by a blunt angle, another obtuse angle extending from beaks to lower-posterior extremity. Interior white, stained with buff-olive on the hinge. Cardinal teeth bifid; anterior lateral very short and strong; posterior lateral long, remote from cardinals. Cuticle dull brown, with a yellow under color, irregularly wrinkle-striate, lamellose behind, and less so over the whole disk. Length 94, breadth 72, diam, 47 mm.

Yaeyama Is., Loo Choo group (Frederick Stearns).

Cyrena yaeyamensis n. sp.* Pl. VIII, fig. 7; pl. IX, fig. 6.

Shell shorter than the preceding, being less produced posteriorly, the posterior surface not so distinctly angular, posterior truncation less marked; anterior lateral tooth not so short. Anterior dorsal slope of hinge line straight, posterior dorsal slope slightly convex. Color and sculpture as in *luchuana*, except that there is usually some oblique corrugation of the posterior slope. Length 75, breadth 63, diam. 36 mm.

Yaeyama Is., Loo Choo group (Frederick Stearns).

This may prove to be a form of *Cyrena papua*, or of *C. buschii* Phil., of China, but it is more triangular, with the posterior margin more produced.

MYTILIDÆ.

Mytilus crassitesta Lischke.* Yaeyama.

Modiola philippinarum Hanley.*

LIMIDÆ.

Lima lima Linn.* Yaeyama.

SPONDYLIDÆ.

Spondylus ducalis Chemn.* Hirama Jima Is.

Spondylis sinensis Sowb.* Hirama Jima Is.

OSTRÆIDÆ.

Ostræa rivularis Gld. (?)* Yaeyama.

Ostræa cucullata Born.* Yaeyama.

Ostræa hyotis Linn. Yaeyama.

Ostræa denselamellosa Lischke.* Yaeyama.

Ostræa cristagalli Linn.* Yaeyama.

PTERIIDÆ.

Pteria macroptera Lam.*

Throughout the Loo Choo group (Stearns).

Some of the specimens collected attain great size, rivalling *M. margaritifera*.

Pteria cochenhauseni Dkr.* (=A. flammata Reeve?) Itoma Jima Is.

Pteria meleagridis (Spengl.) Chemn.* Itoma Jima Is.

Perna (Meleagrina) margaritifera Linn.* Yaeyama.

Malleus regula Forsk.* Yaeyama.

Malleus vulgaris Lam.

In this species the valves are serpentine in their length.

Malleus albus Lam.

Yaeyama. In this species the valves are straighter than in the other. Altogether 21 fine specimens.

PERNIDÆ.

Perna acutirostris Dkr.* Yaeyama.

Perna isognomum Linn.* Yaeyama.

Perna costellata Conr.* Yaeyama.

PINNIDÆ.

Pinna nigrina Lam.*

ARCIDÆ.

Arca scapha Chemn.* Yaeyama.

Arca (Scapharca) subcrenata Lischke.* Itoma Jima Is.

ERRATA.

P. 10. Add the following:

Haminea binotata n. sp.

Shell cylindric-oval, hardly wider below, truncated above, rounded beneath, thin, but rather solid, ruddy-corneous, with a small opaque-white spot at each end, that at apex bounded below, that at columella, above, by an opaque orange or reddish tract, appearing only on the latter part of the whorl. Surface polished, with excessively fine and close spiral striæ, and rather coarse growth wrinkles. Aperture rather narrow, moderately enlarged below. Outer lips rising slightly above the vertex, but by no means high-arched. Columella concave, short, with a lunate, reflexed, but free, not adherent, flange, but not fold. Apex closed or subperforate. Alt. 11, diam. 7 mm.

Yaeyama, Loo Choo Is. (Stearns).

Haminea binotata var. Japonica n. v.

Shell like the above in coloration and sculpture, but smaller, thin and fragile, more swollen, the reflexed columellar callus thinner and adnate to body. Alt. 9, diam. 6·2 mm.

Nemoto, Boshiu (Stearns).

P. 13. Add the following:

Conus flavidus Lamarck. Tryon Man. Conch. VI, p. 44.

Japan, exact locality unknown (Stearns). The specimens are more square-shouldered than typical *flavidus*, in form and coloring more like Reeve's *surgillatus*, but I do not doubt their specific identity. It has not before been reported from Japan.

P. 16. *Columbarium pagoda* was collected by Stearns in the Inland Sea near Awaji.

P. 25. Add:

Mitra (*Scabricola*) *punctolirata* A. Ad. Goto. Is. (Adams).

Mitra (*Scabricola*) *isabella* Swains. (+ *morchii* Ad. and *herklotsiana* Dohrn), Tryon, Manual, IV, p. 137.

P. 49. *Oniscia*. The name of this genus should stand LAMBIDIUM, as Smith has shown, Journal of Malacology, iv, p. 14.

P. 53. For "*Volvula*" read *Volva*.

P. 73. Add above *Adeorbiidæ* the following:

Lamellariidæ.

Lamellaria punctata Stimpson. Proc. Acad. Nat. Sci., Phila., 1855, p. 378. Oushima (Stimp.). Described as *Coriocella*.

P. 98. Add:

Photinula (?) *quæsita* A. Adams. Man. Conch, XI, p. 281.

Aniwa Bay. Tatiyama, Kino-o-sima, 17 fms. (Ad).

P. 159. Add the following *Unionidæ*:

Unio Japanensis Lea. Paddy fields near Tokyo.

Unio nipponensis Martens. Paddy fields near Kamakura.

Dipsas plicatus Sol. Rice paddy fields, near Yokohama.

Dipsas Reinianus Mart. Paddy fields near Yokohama.

Anodonta cellensis Schrot. Odelawara.

Anodonta Japonica Martens. Paddy fields near Sagama.

Anodonta Woodiana Lea. Rice paddy fields near Yokohama.

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[The figures of *Eulota Blakeana* Newc. were drawn from specimens belonging to the museum of Cornell University; those of *Chlorostoma umbilicatum* and *Bathybembyx Crumpii* from specimens in the collection of Mr. Shelly G. Crump; and the figure of *Terebratulina caput-serpentis* represents a specimen in coll. U. S. Nat. Mus. All other figures are from specimens collected by Mr. Stearns].

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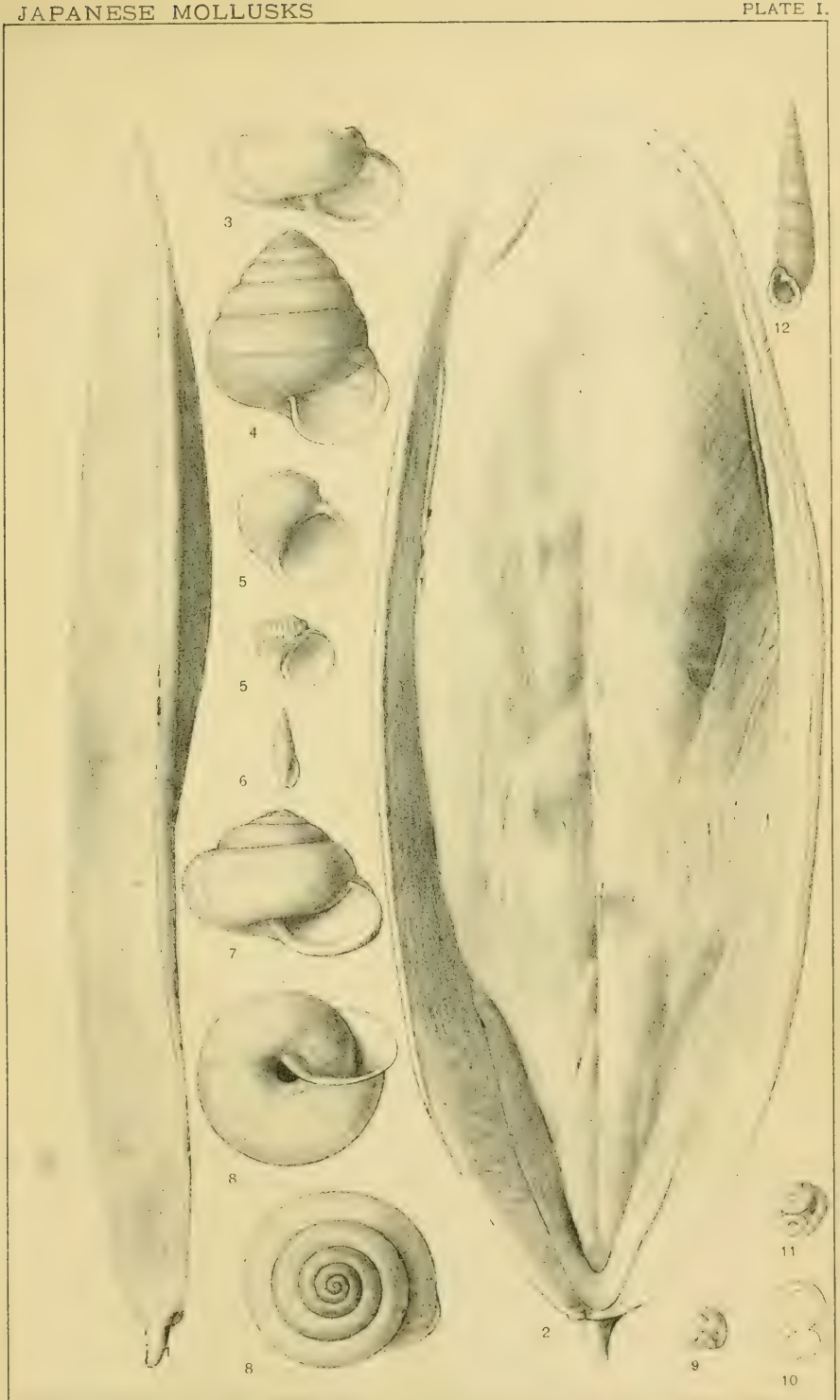

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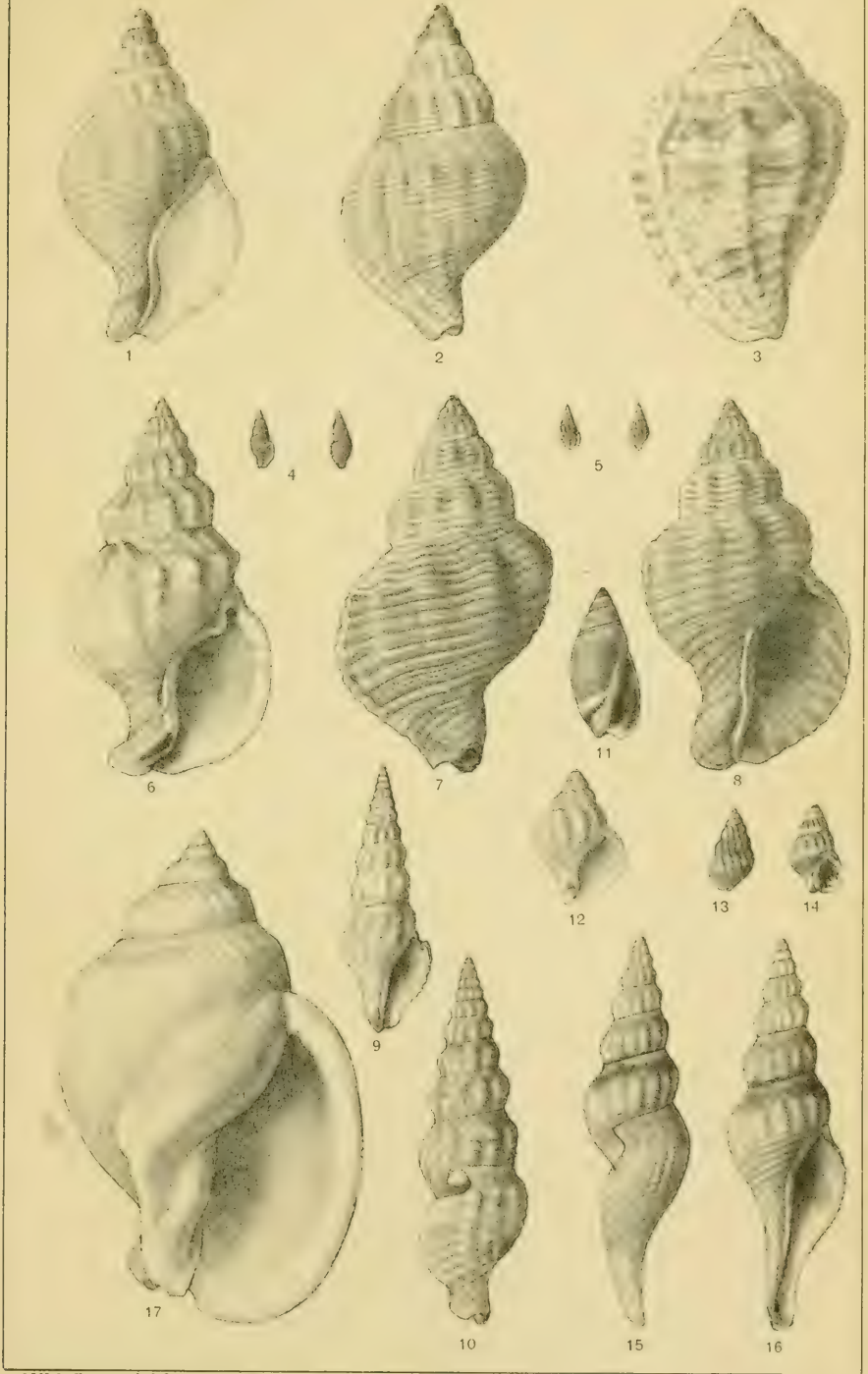

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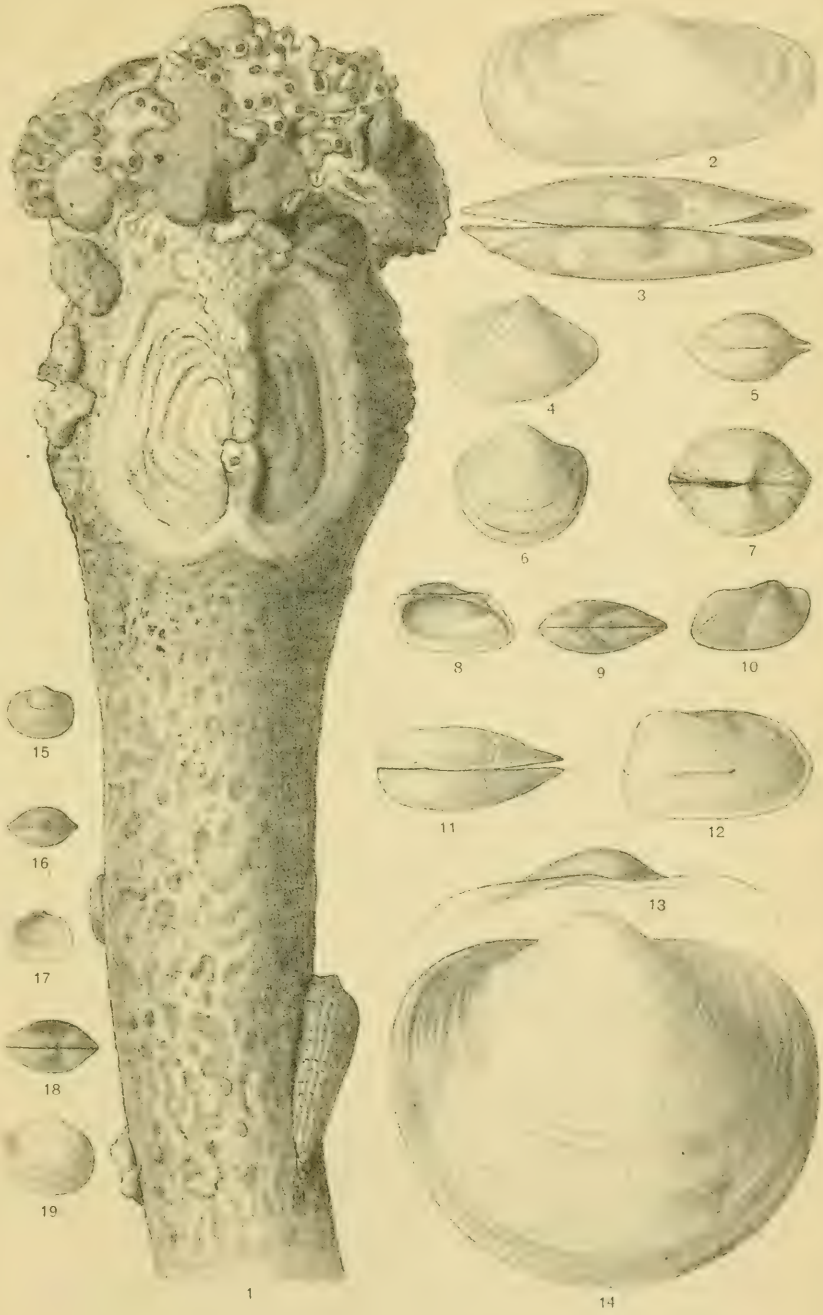

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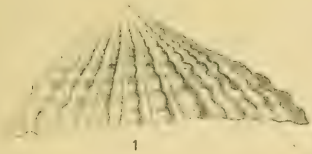
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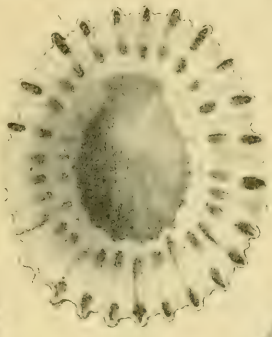
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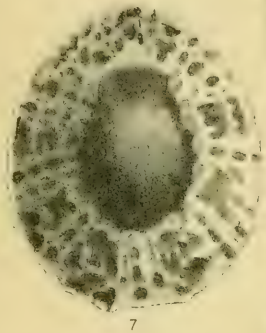
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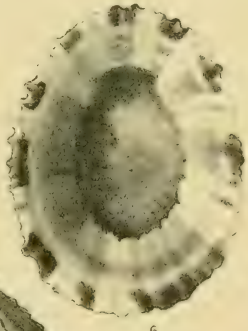
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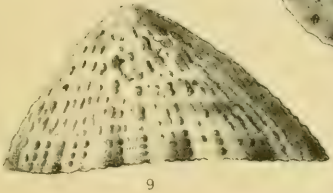
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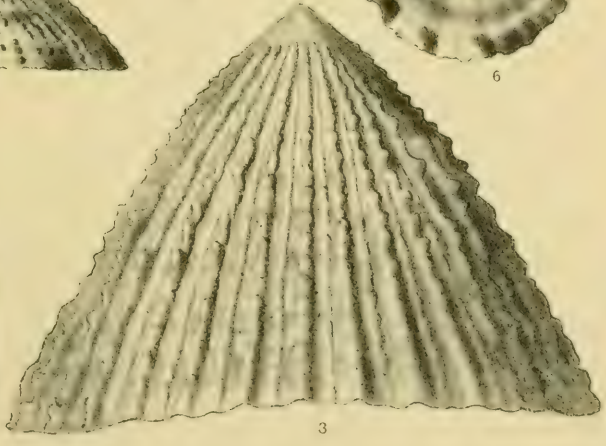
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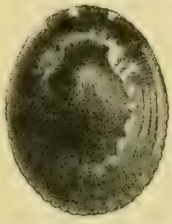
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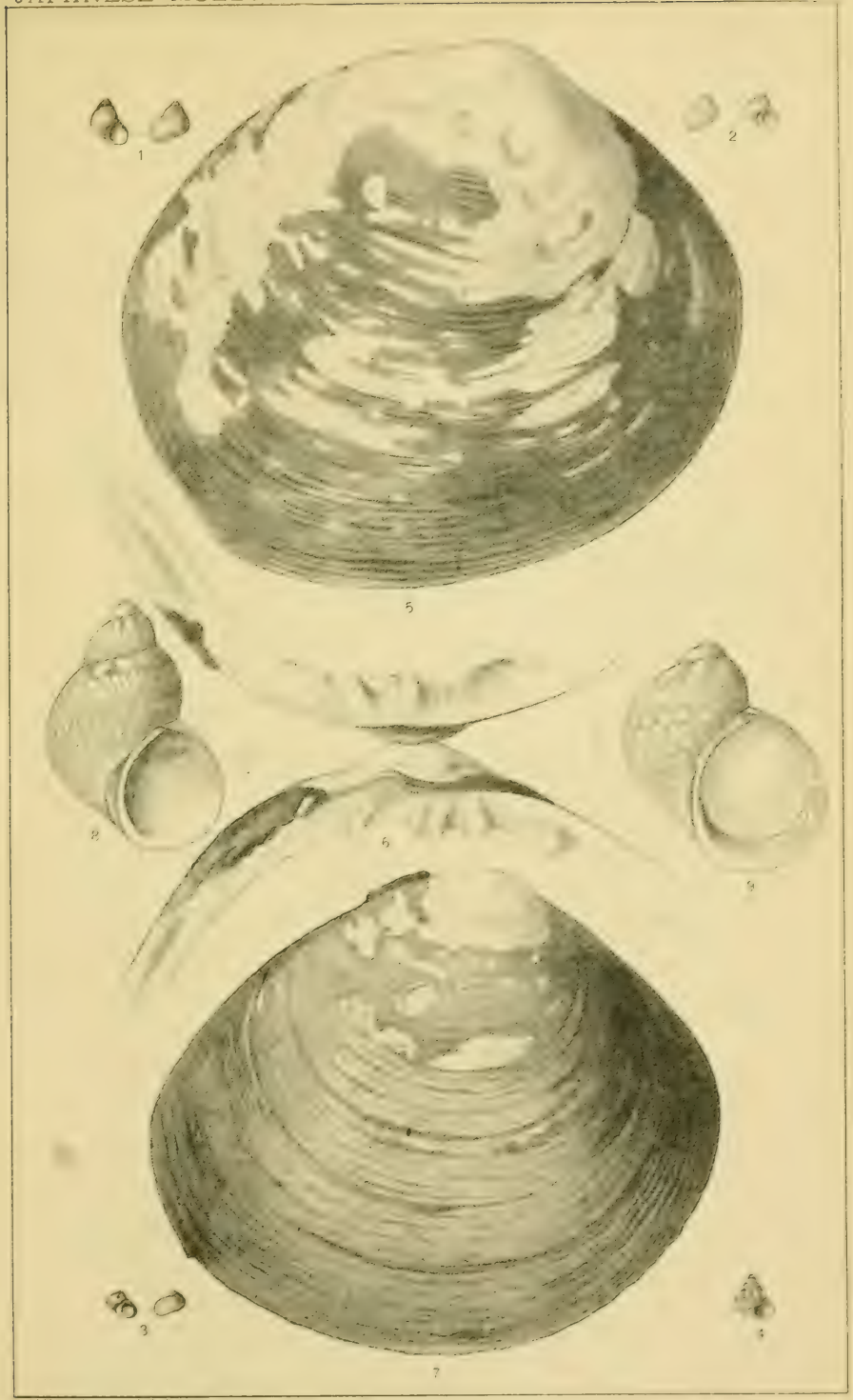

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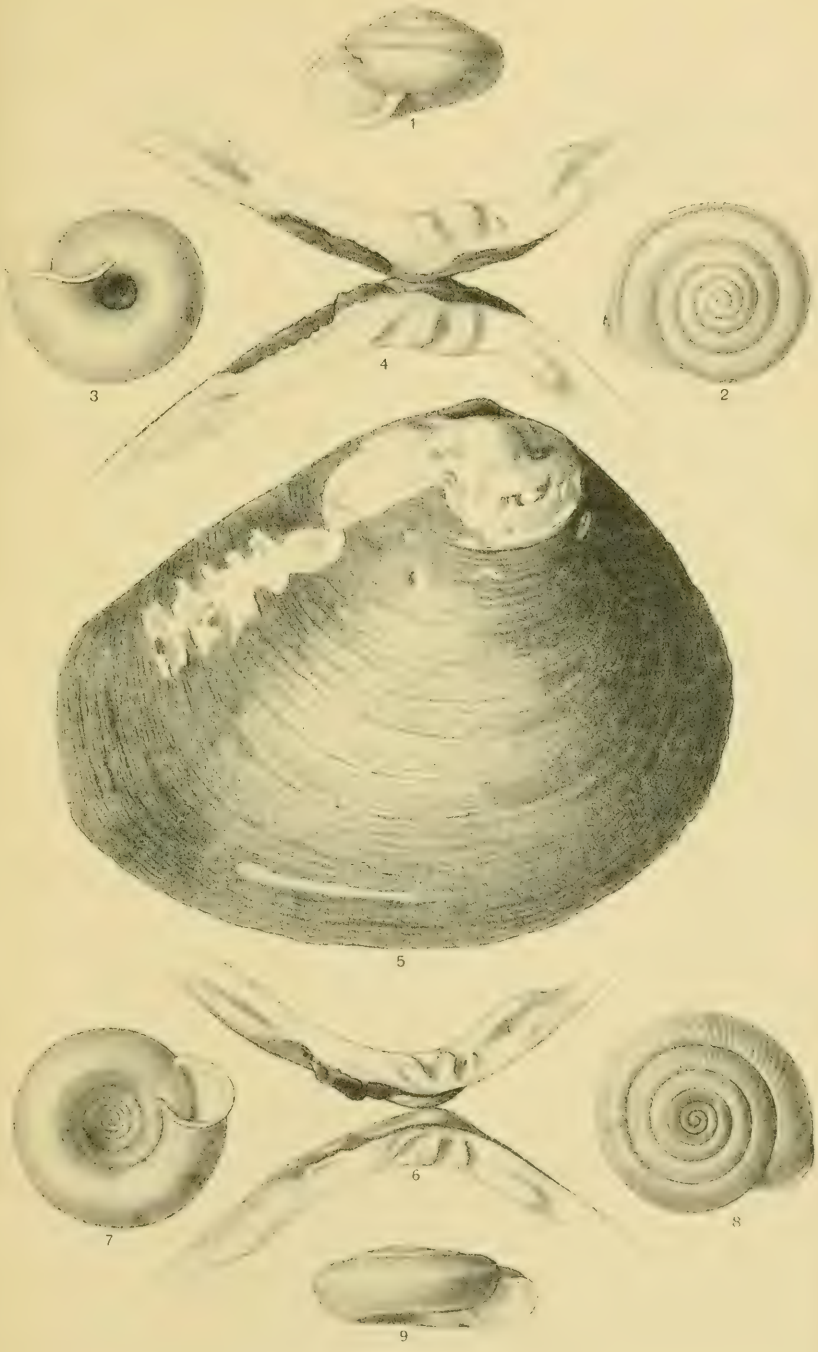

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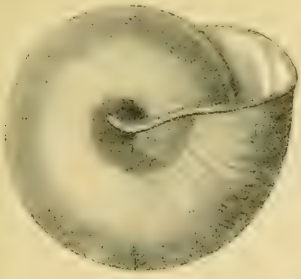
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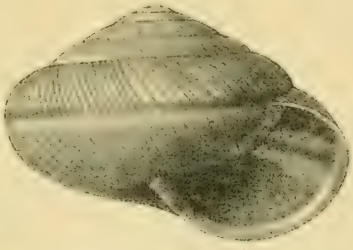
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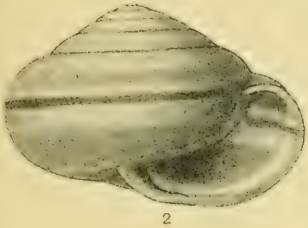
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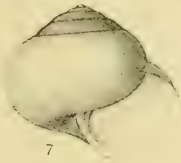
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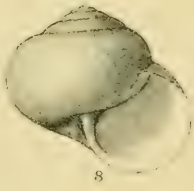
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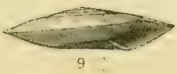
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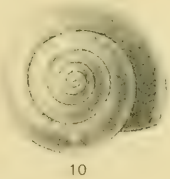
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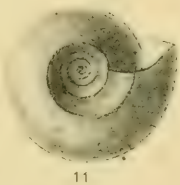
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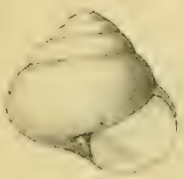
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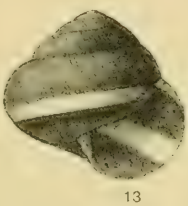
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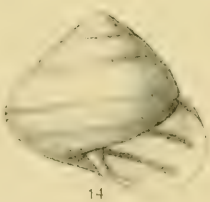
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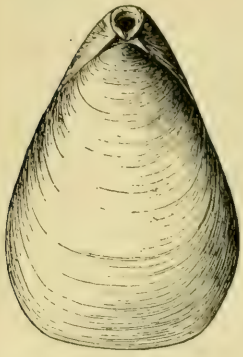

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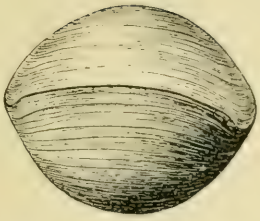

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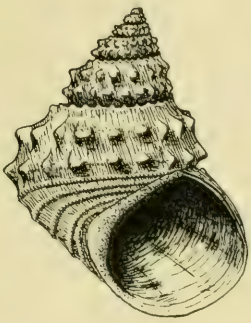

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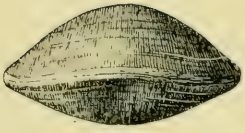

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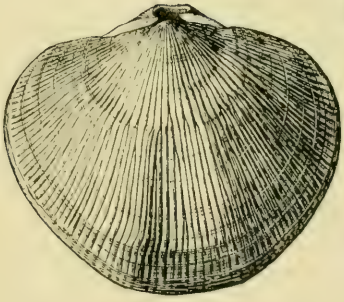

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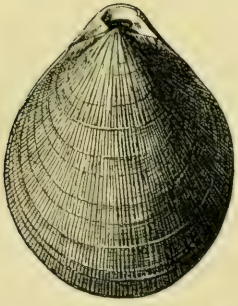

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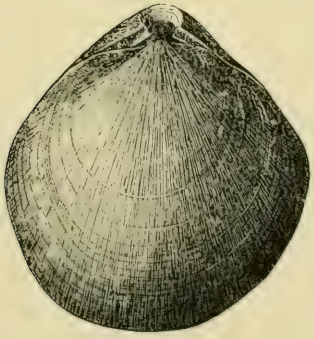

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